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BUNDESREPUBLIK DEUTSCHLAND

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Bescheinigung

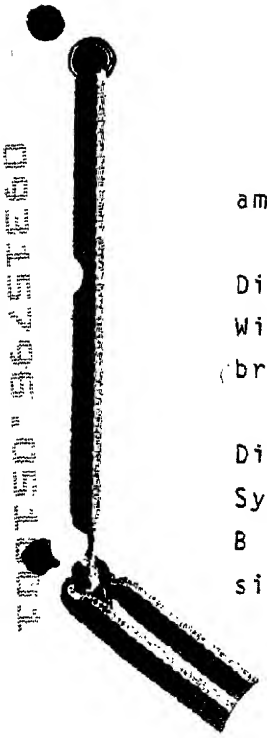
Die MAN Roland Druckmaschinen AG in 6050 Offenbach hat eine Gebrauchsmusteranmeldung unter der Bezeichnung

"Einrichtung zum Inline-Beschichten von Bedruckstoffen in Offsetdruckmaschinen"

am 16. April 1993 beim Deutschen Patentamt eingereicht.

Die angehefteten Stücke sind eine richtige und genaue Wiedergabe der ursprünglichen Unterlagen dieser Gebrauchsmusteranmeldung.

Die Anmeldung hat im Deutschen Patentamt vorläufig die Symbole B 41 F 7/06, B 41 F 5/24, B 41 F 31/06, B 41 F 9/10, B 41 F 9/16 und B 05 C 1/08 der Internationalen Patentklassifikation erhalten.



München, den 28. Februar 1994
Der Präsident des Deutschen Patentamts
Im Auftrag

Grüner

Aktenzeichen: G 93 05 [redacted] 8

A 9161
6.90

MAN Roland Druckmaschinen AG
Christian-Pleß-Str. 6-30, 6050 Offenbach/Main

Einrichtung zum Inline-Beschichten von Bedruckstoffen in Offsetdruckmaschinen

Die Erfindung betrifft eine Einrichtung zum Beschichten von Bedruckstoffen in Mehrfarben-Offsetdruckmaschinen mit mehreren Lackierwerken.

In der Zeitschrift FlexoDruck, 2-93, Seite 42-43, ist im Artikel "Goldlackdruck löst Metall-Bronzierung ab" angegeben, daß in einer Mehrfarben-Offsetdruckmaschine mit zwei sogenannten Lacktürmen eine Goldlackfarbe verarbeitet wurde. Dazu wurde ein Lackturm als Flexodruckwerk umgerüstet, wobei mit konventioneller Lackiertechnik eine Flexodruckplatte zum Beschichten eingesetzt wurde. Gegenüber der konventionellen Lackdosierung wurde auf die Option zur Verwendung eines Kammerrakels hingewiesen.

Ein Auftragswerk für hochviskose, ölhaltige oder niedrigviskose wasserlösliche Schichten ist aus der DE 3 906 648 A1 bekannt. Dieses Auftragswerk ist als Lackiereinrichtung, wahlweise als Offset-, Hochdruck- oder Tiefdruckwerk ausgebildet. Die Ausführungen gehen von einer strukturierten Schöpfwalze aus, die mit einem Rakelblatt korrespondierend bzw. von einer Auftragwalze und einem strukturierten Formzylinder, der mit einem Rakelblatt korrespondiert. Das Hochdruckwerk besteht dabei aus einer mit Näpfchen profilierten Schöpfwalze, der ein Rakelblatt zugeordnet ist, einer Übertragwalze, der Glättwalzen zugeordnet sind und einem Formzylinder mit Hochdruckform.

Aus der DE 4 122 990 A1 sind eine Bronze- und Effektdruckfarbe und ein Verfahren zur Herstellung eines Bronze- und Effektdruckes

bekannt. Dort wird eine wasserverdünnbare Druckfarbe mit hoher Viskosität und hohem Pigmentanteil beschrieben. Diese soll aus dem Lackwerk einer Offsetmaschine oder einem Flexodruckwerk verarbeitet werden. Als Vorteil wird der kurze Verarbeitungsweg mit wenigen Farbspaltungen angegeben.

Beispielsweise aus der DE 3 614 582 A1 ist ein sogenanntes Kammerrakel zum Auftragen einer Beschichtungsmasse auf eine Beschichtungswalze bekannt. Mindestens zwei, an einer Walze anliegende, Rakelblätter bilden eine Kammer zur Aufnahme einer Masse, die unter Druck zugeführt wird.

Aufgabe der Erfindung ist es, eine Beschichtungseinrichtung nach dem Oberbegriff des Anspruchs 1 weiterzuentwickeln, um auf einfache Weise eine problemlose Inline-Verarbeitung von schnellverdunstenden Druckfarben mit hohem Pigmentanteil bzw. groben Pigmenten kombiniert mit weiterbehandelnden Druck- oder Beschichtungsvorgängen zu ermöglichen.

Gelöst wird die Aufgabe durch den kennzeichnenden Teil des Hauptanspruches. Weiterbildungen ergeben sich aus den Unteransprüchen.

Die erfindungsgemäße Lösung gestattet es, das Inline-Beschichten mit höherviskosen Flüssigkeiten in einer Offsetdruckmaschine vorzunehmen unter besonderer Berücksichtigung von Lacken bzw. pigmentierten Farben auf Wasserbasis (Metallglanzdrucke). Einsatzgebiete bestehen für ausgespartes Lackieren (Spotlackierung) oder vollflächiges Lackieren. Aufgrund der geschlossenen Kammer beim Kammerrakel wird die Verdunstung der verwendeten Flüssigkeit reduziert. Dadurch wird die Verarbeitung von schnell verdunstenden, z.B. wasserlöslichen Flüssigkeiten verbessert. Die Kombination von mehreren Offsetdruckwerken und mindestens einem Flexodruckwerk kann in unterschiedlichen Anordnungen erfolgen, wobei diesen Einrichtungen in der Regel eine weitere Lackiereinrichtung, z.B. zum vollflächigen Lackieren, nachgeordnet ist.

Die Erfindung wird im Folgenden beispielhaft erläutert. Dabei zeigt

Fig. 1 eine erste Einrichtung zum Beschichten und

Fig. 2 eine Variante der Einrichtung zum Beschichten.

In Figur 1 ist eine Mehrfarben-Offsetdruckmaschine mit zwei Lackiereinrichtungen gezeigt. Die Offsetdruckmaschine (hier ohne An- und Ausleger) besteht aus fünf Druckwerken 1 bis 5, daran in Bogenlaufrichtung angeschlossen einer als Flexodruckwerk 6 ausgerüsteten Beschichtungseinrichtung und einer dieser nachgeordneten herkömmlichen Lackiereinheit 7. Dabei kann das Flexodruckwerk 6 als Spotlackiereinrichtung (für ausgespartes Lackieren) und die nachgeordnete Lackiereinheit 7 zum vollflächigen Oberflächenfinishing eingesetzt werden.

Die Flexodruckwerk 6 wie auch die Lackiereinheit 7 bestehen aus je einem Druckzylinder 8.1, 8.2, einer Transfertrommel 9.1, 9.2 und einem Formzylinder 10.1, 10.2.

In der Flexodruckwerk 6 ist auf den Formzylinder 10.1 eine flexible Hochdruckplatte aufgespannt, zB. eine Flexodruckplatte. In Kontakt mit dem Formzylinder 10.1 ist eine Auftragwalze 11 mit strukturierter Oberfläche mit Rasternäpfchen, eine sogenannte Rasterwalze, angeordnet. An die Auftragwalze 11 anstellbar ist dieser ein Kammerrakel 12 zugeordnet. Das Kammerrakel 12 kann zB. an seiner Oberseite mittig mit einem Flüssigkeitszulauf und zwei austretende Flüssigkeitsabläufen im Bereich der Seitenteile versehen sein. Der Flüssigkeitszulauf ist mit einer Förderpumpe, die Flüssigkeitsabläufe 11 hingegen mit einer Saugpumpe verbunden. Die Pumpen sind erforderlich, um speziell durch die Pigmentierung höherviskose Flüssigkeit z.B. auf Wasserbasis, wie z.B. Gold- und Silberdruckfarbe, Deckweiß oder Lack, verarbeiten zu können.

Über die Rasternäpfchen der Auftragwalze 11 wird die Beschichtungsmasse zum Einfärben der Hochdruckform auf den Formzylinder

10.1 transportiert und auf den vom Druckzylinder 8.1 zugeführten Bedruckstoff aufgebracht. Während des von der Auftragwalze 11 bewirkten Flüssigkeitstransports sorgt die Kammerrakel 12 dafür, daß die Flüssigkeit ausschließlich in den Rasternäpfchen verbleibt.

Die Lackiereinheit 7 weist demgegenüber eine Walzenpaar zur Bildung eines Dosierspalts auf. Dabei ist eine Dosierwalze 13 an eine Auftragwalze 14 angestellt. Die Beschichtungsmasse wird direkt in den Spalt zwischen beiden Walzen eingeführt und über die Auftragwalze 14 dem Formzylinder 10.2 zugeführt. Dieser trägt sie dann am Druckzylinder 8.2 auf den zugeführten Bedruckstoff auf.

Durch die Staffelung Offsetdruck, Flexodruck und Lackieren ist speziell für Metallglanz-Beschichtungen ein besonders gutes Arbeitsergebnis erzielbar. Dabei ist die Kombination von schneller Verarbeitung der leicht verdunstenden Metalldruckfarbe bzw. des Drucklacks mit einer nachträglichen, den Glanz erhöhenden Lackbeschichtung hervorzuheben.

Ein vergleichbares System ist in Figur 2 dargestellt. Hier ist das Flexodruckwerk 6 vor dem ersten Druckwerk 1 der Offsetdruckmaschine eingesetzt. Mit einer derartigen Konfiguration lassen sich Basisbeschichtungen vor dem Drucken aufbringen, z.B. Deckweiß-Beschichtungen auf Blechmaterial, Kunststoffolie oder Karton. Die abschließende Lackierung kann weiterhin dadurch ermöglich werden, daß ein Lackierwerk 7 nach dem letzten Druckwerk 5 oder auch ein intergriertes Lackierwerk an einem konventionellen Druckwerk angeordnet ist.

Vergleich ist auch eine Anordnung des Flexodruckwerkes 6 innerhalb der Offsetdruckmaschine zum Aufbringen von Zwischenbeschichtungen etwa mit Trocknungsfunktion.

P 12 03 94

Ansprüche

1.) Einrichtung vorzugsweise in Bogenrotationsdruckmaschinen für mehrfarbigen Offsetdruck zum Beschichten von Bedruckstoffen mit wenigstens zwei Lackiereinheiten,
d a d u r c h g e k e n n z e i c h n e t,
daß jede Lackiereinheit einen Druckzylinder (8), einen Formzylinder (10) und eine Auftragwalze (11,14) enthält und die entsprechend Bogenlaufrichtung vorgeordnete Lackiereinheit als Flexodruckwerk (6) ausgebildet ist.

2.) Einrichtung nach Anspruch 1,
d a d u r c h g e k e n n z e i c h n e t,
daß im Flexodruckwerk (6) eine Auftragwalze (11) vorgesehen ist, an die ein Kammerrakel (12) anstellbar angeordnet ist, wobei die Auftragwalze (11) als Rasterwalze ausgebildet ist.

3.) Einrichtung nach Anspruch 1 und 2,
d a d u r c h g e k e n n z e i c h n e t,
daß dem Flexodruckwerk (6) eine konventionelle Lackiereinheit (7) direkt oder indirekt nachgeordnet ist und in der Lackiereinheit (7) eine Auftragwalze (14) vorgesehen ist, der eine Dosierwalze (13) zur Bildung eines gemeinsamen Dosierspaltes anstellbar zugeordnet ist.

4.) Einrichtung nach Anspruch 1 und 2,
d a d u r c h g e k e n n z e i c h n e t,
daß das Flexodruckwerk (6) aus folgenden Elementen besteht: dem, eine Hochdruckform tragenden Formzylinder (10.1), der mit dem Druckzylinder (8.1) in Kontakt steht, der Auftragwalze (11) mit Rasterstruktur, die mit dem Formzylinder (10.1) in Kontakt steht und dem Kammerrakel (12) besteht, das mit einer

Förderpumpe zur Flüssigkeitszufuhr und einer Saugpumpe zur Flüssigkeitsrückführung verbunden ist.

5.) Einrichtung nach Anspruch 1 und 2,
d a d u r c h   g e k e n n z e i c h n e t,
daß das Flexodruckwerk (6) in einer Offsetdruckmaschine zwischen den Druckwerken (1-5) angeordnet ist.

6.) Einrichtung nach Anspruch 1 und 2,
d a d u r c h   g e k e n n z e i c h n e t,
daß das Flexodruckwerk (6) in einer Offsetdruckmaschine den Druckwerken (1-5) vorgeordnet ist.

7.) Einrichtung nach Anspruch 1 und 2,
d a d u r c h   g e k e n n z e i c h n e t,
daß das Flexodruckwerk (6) in einer Offsetdruckmaschine den Druckwerken (1-5) nachgeordnet ist.

Zusammenfassung

Die Erfindung betrifft eine Einrichtung zum Beschichten von Bedruckstoffen in Druckmaschinen zum Auftragen höherviskoser Flüssigkeiten auf Wasserbasis. Aufgabe der Erfindung ist es, eine dementsprechende Einrichtung für Druckmaschinen zu entwickeln, die eine Inlineverarbeitung von höherviskosen Flüssigkeiten gestattet. Gelöst wird die Aufgabe dadurch, daß einer konventionellen Lackiereinheit (7) ein Flexodruckwerk (6) vorgeordnet wird.

Sig. Fig. 1

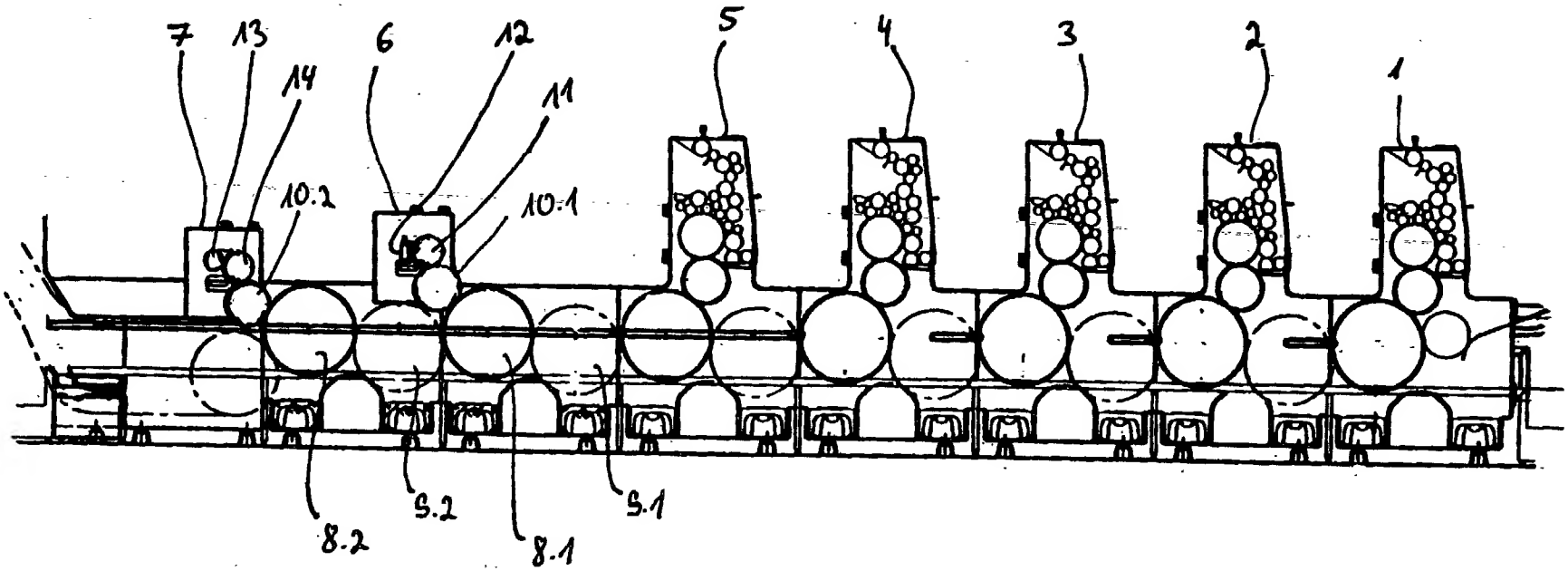


Fig. 1

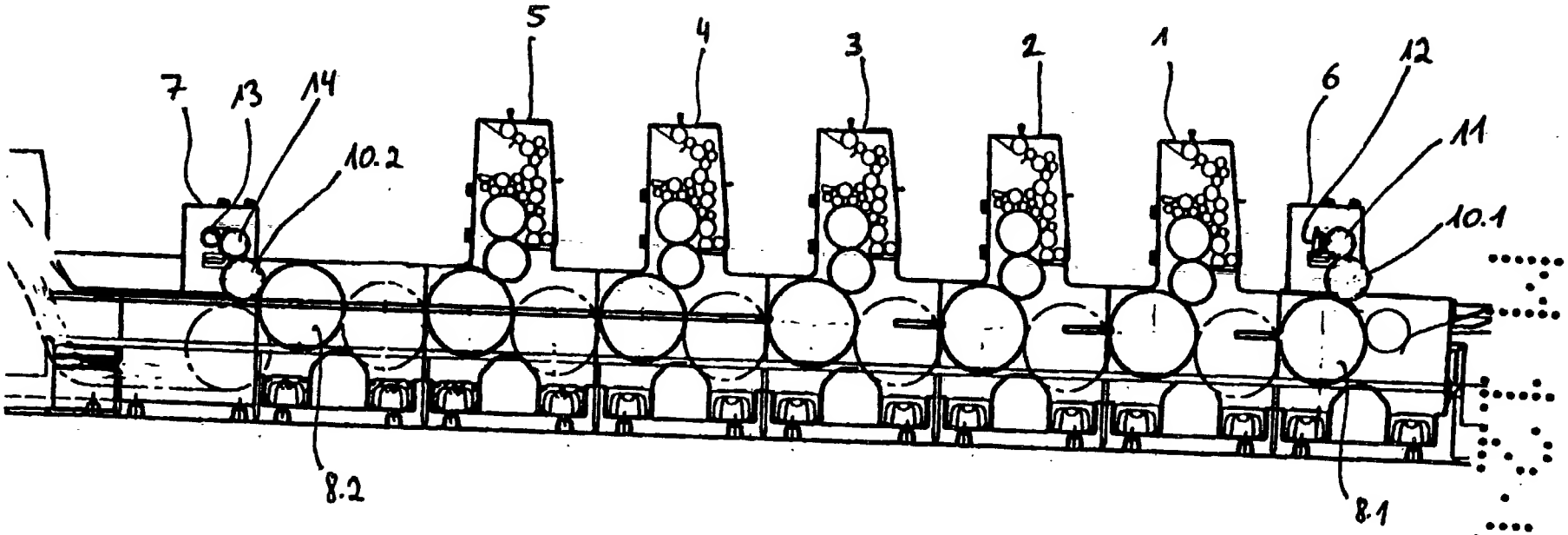


Fig. 2

PATENT NO EP (UK) 0620115

TRANSLATION OF EUROPEAN PATENT (UK) UNDER SECTION 77 (6) (a)

PATENTS ACT 1977

In the matter of
European Patent (UK)
0620115

DECLARATION

I, Richard John Gallafent, a Chartered Patent Agent, of 9 Staple Inn, London WC1V 7QH, declare that I am the translator of the document attached and certify that it is a true translation to the best of my knowledge and belief of the final text in European Patent Application 94103832.5, which is to be granted as European Patent 0620115.

.....
RICHARD JOHN GALLAFENT

9 February 98

.....
DATE

The invention relates to a device for coating material to be printed in multi-colour offset printing presses with multiple varnishing units (see, e.g. DE-A-3941571).

In the Journal FlexoPrint 2-93, pages 42-43, it is stated in the article "Gold varnish print replaces metal bronzing" that in a multi-colour offset printing press with two so-called varnish towers, a gold varnish ink was processed. For this, one varnish tower was converted to be a flexoprint unit, wherein using conventional varnishing technology, a flexo printing plate is used for coating. In contrast to the conventional varnish metering, attention is directed to the option of using a comb doctor.

An application unit for highly viscous oil-containing or low viscous water-soluble layers is known from DE 3 906 648 A1. This applicator unit is constructed as a varnish device, according to choice as offset, relief or intaglio print unit. The embodiments start out from a structured scoop roller which correspondingly with a doctor blade or by means of an applicator roller and a structured forme cylinder which corresponds with a doctor blade. The letterpress printing unit consists in this connection of a scoop roller profiled with little depressions to which a doctor blade is arranged, a transfer roller to which smoothing rollers are arranged and a forme cylinder with a relief forme.

From DE 4 122 990 A1, a bronzing and effect printing ink and a process for manufacturing a bronzing and effect print are known. There a water-thinnable printing ink of high viscosity and high pigment content is described. This should be processed from the varnishing unit of an offset press or a flexo printing unit. Given as an advantage is the short working path with few ink splittings.

Known, for example, from DE 3 614 582 A1 is a so-called chamber doctor for applying a coating composition to a coating roller. At least two doctor blades lying against a roller form a chamber for the receipt of a composition which is fed in under pressure.

It is the object of the invention further to develop a coating device of the type known, e.g. from the document DE-A-3941571 in order, in simple fashion, to make possible problem-free in-line operation with rapidly evaporating aqueous printing inks or printing varnishes with a high pigment content or coarse pigments combined with further treating, printing or coating processes.

The problem is solved by the features of the main claim. Further developments are evident from the sub-claims.

The solution in accordance with the invention permits the in-line coating with higher viscosity liquids to be undertaken in an offset printing press with particular reference to varnishes or pigmented inks on an aqueous basis (metallic effect print). Areas of application consist in separate area varnishing (spot varnishing) or full surface varnishing. Because of the closed chamber at the chamber doctor, the evaporation of the liquid used is reduced. Thereby processing rapidly evaporating, e.g. water-soluble liquids, is improved. The combination of several offset printing units and at least one flexo printing unit can result in differing arrangements, wherein with respect to this unit as a rule a further varnishing unit, e.g. for full surface varnishing, is installed downstream.

The invention is explained by way of example in what follows. In this connection

Fig. 1 shows a first device for coating and

Fig. 2 a variant of the device for coating.

In Figure 1, a multi-colour offset printing press with two varnishing units is shown. The offset printing press (here without feeder and delivery) consists of five printing units 1 to 5, then afterwards in the sheet running direction a coating unit equipped as a flexo print unit 6 and arranged after this a customary varnishing unit 7. In this connection, the flexo print unit 6 can be used as a spot varnishing unit (for separate area varnishing) and the subsequently arranged varnishing unit 7 for full surface surface finishing.

The flexo print unit 6 as well as the varnishing unit 7 also consists in each case of a impression cylinder 8.1, 8.2 a transfer drum 9.1, 9.2 and a forme cylinder 10.1, 10.2.

In the flexo print unit 6, a flexible relief printing plate is tensioned on to the forme cylinder 10.1, e.g. a flexo print plate. In contact with the forme cylinder 10.1 is arranged an applicator roller 11 with a structured surface with a grid of little depressions, a so-called raster roller. Settable against the applicator roller 11 there is a chamber doctor 12 arranged relative to this. The chamber doctor 12 can, e.g. be provided at its upper side centrally with a liquid feed and two outlet liquid drains in the region of the side parts. The liquid feed is connected with a feed pump, the liquid outlets 11 in contrast with a suction pump. The pumps are necessary in order to be able to work particularly with liquid of high viscosity because of pigmentation, e.g. on an aqueous basis, such as, e.g. gold and silver printing inks, cover white or varnish.

The coating composition for inking up the relief print form on the forme cylinder is transported via the raster depressions of the applicator roller 11 and applied on to the material to be printed fed from the impression cylinder 8.1. During the liquid transport effected by the applicator roller 11, the chamber doctor 12 takes care that the liquid remains exclusively in the raster depressions.

The varnishing unit 7 has in contrast a pair of rollers to form a metering slot. In this connection, a metering roller 13 is set against an applicator roller 14. The coating composition is fed directly into the slot between both rollers and fed via the applicator roller 14 to the forme cylinder 10.2. This then applies it at the impression cylinder 8.2 on to the material to be printed which is fed in.

By the staggered arrangement of offset printing flexo printing and varnishing, especially for metal gloss coatings a particularly good working result can be achieved. In this connection, the combination of rapid working of the easily evaporating metal printing inks or the printing lacquers with a subsequent gloss-enhancing varnish coating is to be recommended.

A comparable system is illustrated in Figure 2. Here the flexo print unit 6 is put prior to the first printing unit 1 of the offset printing press. With this sort of configuration, basic coats can be applied before printing, e.g. cover white coatings on to sheet material, plastics, foils or card. The final varnishing can furthermore be made possible in that a varnishing unit 7 is arranged after the last printing unit 5 or also an integrated varnishing unit is arranged on a conventional printing unit.

Also comparable is an arrangement of the flexo print unit 6 within the offset printing press for the application of intermediate coatings and if needed with a drying function.

Patent claims

1) Device in a rotary printing press for multi-colour offset printing for coating material to be printed with at least two varnishing units, wherein each varnishing unit has an impression cylinder (8), a forme cylinder (10) and an applicator roller (11, 14), and the varnishing unit arranged upstream corresponding to the sheet running direction is constructed as a flexo print unit (6), wherein the flexo print unit (6) consists of the following elements:
a relief forme carrying forme cylinder (10.1) which is in contact with the impression cylinder (8.1), an applicator roller (11) with a raster structure, which is in contact with the forme cylinder (10.1) and a settable-on chamber doctor (12) which is connected with a feed pump for liquid feed and a suction pump for liquid return wherein directly or indirectly arranged after the flexo print unit (6) is a varnishing unit (7) and wherein in the varnishing unit (7) an applicator roller (14) is provided relative to which a metering roller (13) is arranged to form a common metering slot.

2) Device according to Claim 1, characterised in that the flexo print unit (6) is arranged in an offset printing press between the printing units (1-5).

3) Device according to Claim 1, characterised in that the flexo print unit (6) is arranged in an offset printing press prior to the printing units (1-5).

4) Device according to Claim 1, characterised in that the flexo print unit (6) is arranged in an offset printing press subsequent to the printing units (1-5).

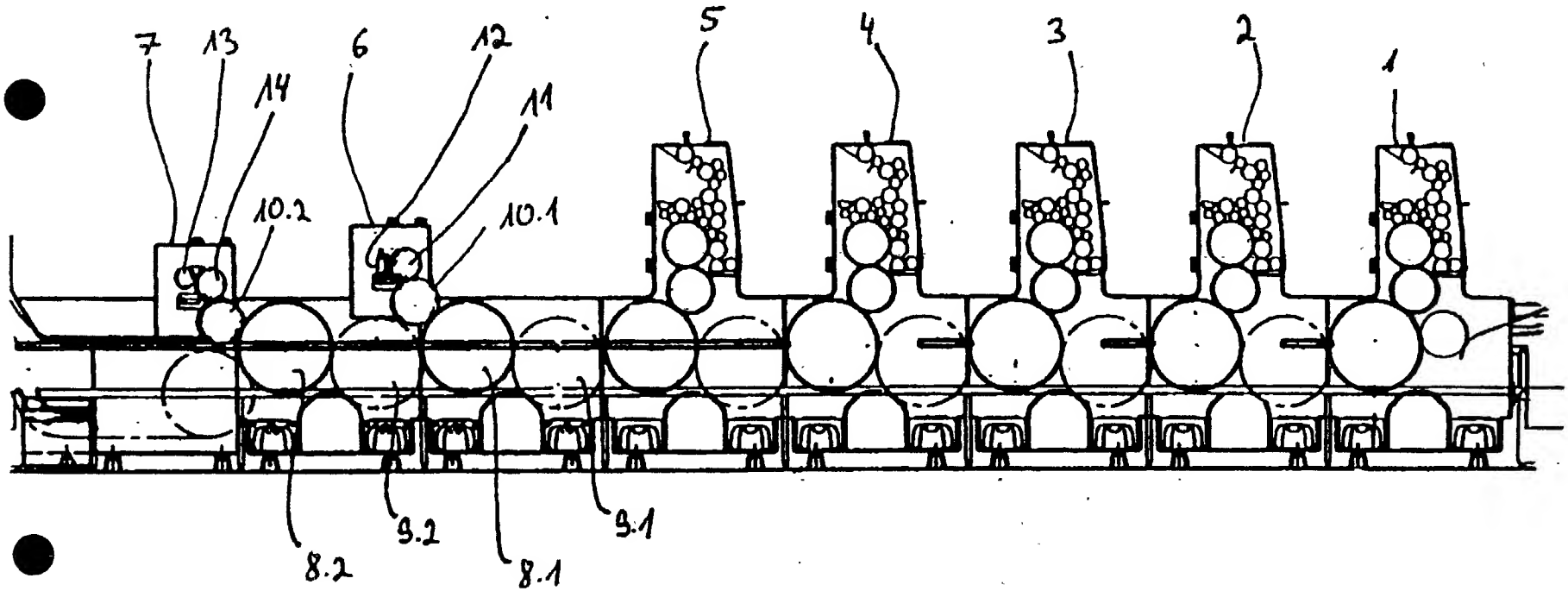


Fig. 1

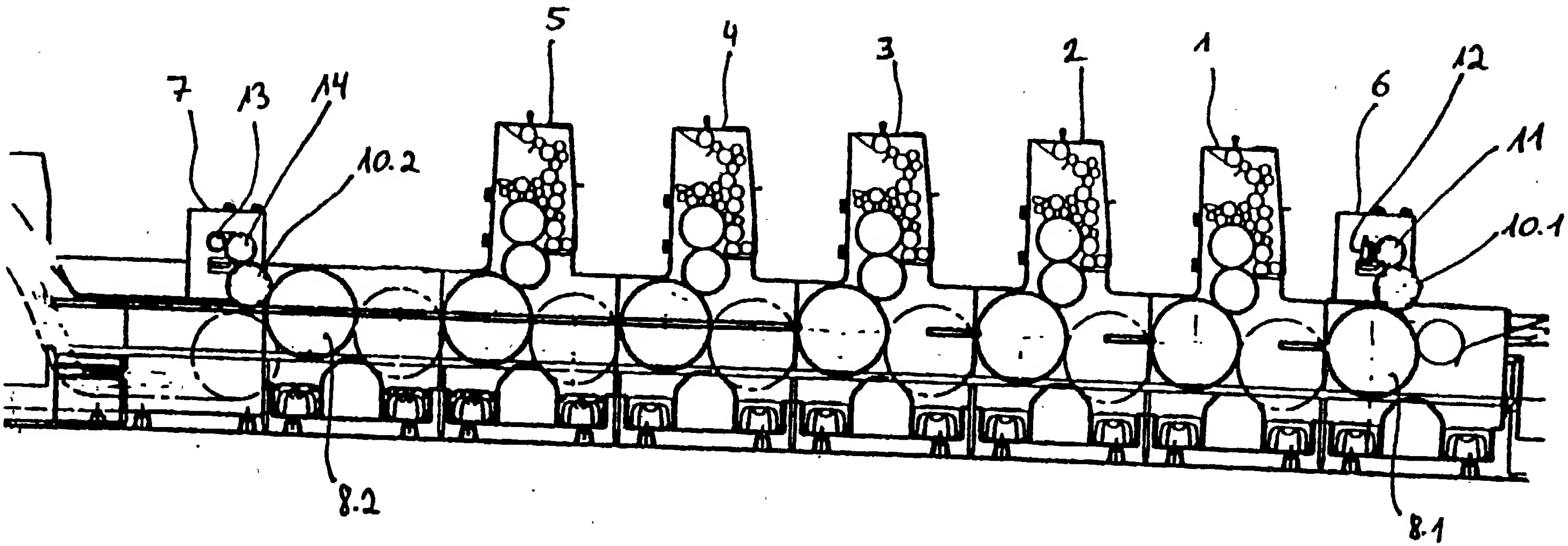


Fig. 2

Patents Form 54/77

Patents Act 1977
(Rule 80 and Schedule 4)

THE PATENT OFFICE

Filing a translation in connection with a European patent or a European patent application
(See the notes on the back of this form)

The Patent Office

Cardiff Road
Newport
Gwent NP9 1RH

THE PATENT OFFICE
-9 OCT 1996

1.	Your reference	22611
2.	European patent number or publication number of application *(or International publication number (see note (e))*	0620115
3.	Full name and address of the or of each applicant for or proprietor of the European patent (UK) MAN Roland Druckmaschinen AG, Mühlheimer Strasse 341 D-63075 Offenbach, Germany Patents ADP number *(if you know it)*	
4	What kind of translated document listed at note (c) are you sending with this form? *(Answer by writing 1(i), 1(ii), 1(iii) or 2)*	1(i)
5.	Date when the European patent (UK) was granted or amended *(see note (f))*	23 APR 1997
6.	Full name, address and postcode in the United Kingdom to which all correspondence relating to this form and translation should be sent Patents ADP number *(if you know it)*	GALLAFENT & CO 9 STAPLE INN LONDON WC1V 7QH 0000729001
7.	Do you want the address in part 6 above to be the address for service recorded on the Register or to replace the address for service currently on the Register? *(If so then write 'YES')*	YES
8.	Signature	Date 9th October 1996
9.	Name and daytime telephone number of person to contact in the United Kingdom	GALLAFENT & CO 0171 242 3094

C

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Reissue Application of:	§	
BILL L. DAVIS and JESSE S. WILLIAMSON	§	
	§	
For Reissue of U. S. Patent 5,630,363	§	Group Art Unit: 2854
Issued May 20, 1997	§	
Serial No. 08/515,097	§	
	§	
Filing Date: May 20, 1999	§	Examiner: S. Funk
	§	J. Hilten
	§	
Serial No.: 09/315,796	§	
	§	
For: **COMBINED LITHOGRAPHIC/**	§	
FLEXOGRAPHIC PRINTING	§	
APPARATUS AND PROCESS	§	

DECLARATION OF JESSE SPEIGHT WILLIAMSON

I, Jesse Speight Williamson, declare the following under penalties of perjury:

1. I am the same Jesse Williamson, co-applicant of the captioned application, who executed on June 30, 2000, a Joint Declaration (1) under 37 C.F.R. §1.131 and (2) pertaining to derivation by DeMoore and Printing Research, Inc. of Reissue Applicants' invention and reaffirm the statements made therein, including, but not limited to par. 4 and to a trip to Germany in late May 1992.

2. Since executing that declaration, U.S. Patent No. 5,638,752 ("the '752 patent") assigned to MAN-Roland has come to my attention. Certain information in the '752 patent pertaining to the possible alternative of using a flexographic step first (e.g., Fig. 3 and Col. 5, line 54 to Col. 6, line 10 and claims 2 and 4) came from my suggestion on May 27, 1992 at the MAN-Roland G.m.b.H. in Offenbach, Germany to two MAN-Roland employees, specifically, Helmuth Pleier, Department Head - Print Demonstration - Printing Service, and Wolfgang Scheißer, Head of Printing Service.

3. On or about Friday, May 22, 1992, immediately following the filing of U.S. Serial No. 887,510, which lead to the WIMS patent, U.S. Patent No. 5,370,976 ("the '976 patent"), assigned to my employer, Williamson Printing Corporation ("WPC"), I left for Germany on a trip arranged by Harry Bowyer of Wolstenholme International (U.K.). Upon reaching Frankfurt, Germany on Saturday, May 23, 1992, we stayed over the weekend in the Frankfurt area. I recall a trip with Harry Bowyer and Gary Doughty who worked for Classic Color, a subsidiary of WPC, first to visit several boutique color repro companies doing "Hi-Fi" work (namely, Reuffurth

G.m.b.H., Mühlheim, May 25, 1992; Witteman and Küppers Reprowerkstätten G.m.b.H., Frankfurt, May 26, 1992; Eder Repros Offset-Repro G.m.b.H., Stuttgart, May 27, 1992) before visiting MAN-Roland's facilities in Offenbach, Germany.

4. After Harry Bowyer, Gary Doughty and I arrived at MAN-Roland's Offenbach facilities on the afternoon of May 27, 1992, we met Helmuth Pleier and Wolfgang Schweißer, and they showed us through MAN-Roland's showroom, in which a large number of MAN-Roland presses were displayed. One of these presses was a MAN-Roland six color 40 inch press, which we were told was a Roland 700 series prototype. Since this was a six color press, it was also referred to as a Roland 706. The MAN-Roland personnel described the various features of the prototype press, including its speed of a maximum of fifteen thousand sheets per hour. This Roland 700 series press had two end-of-press tower coaters, the one at the end being equipped with an anilox roller. I was aware that the Roland 700 series was first started in about 1990, but, to the best of my knowledge, prior to this time no Roland 700 series had ever had a tower coater with an anilox roller. It was my understanding at that time that anilox rollers were typically employed in flexographic work, and this was the first time I had seen an anilox roller on an offset lithographic press.

5. One of the purposes of the trip to MAN-Roland was for WPC and Wolstenholme to convince MAN-Roland to utilize our WIMS technology, which is now embodied in the '976 patent. At the time of the trip in May 1992, I was considering various possibilities to try to get a larger volume of metallic ink and larger metallic ink particles deposited on the substrate when printing with WIMS. In the showroom, MAN-Roland's personnel showed me several press test sheets of various labels and cartons that had been printed with metallic inks, silver and gold, on the prototype MAN-Roland 700 series six color press with the anilox roller in the tower coater. We were told that the metallic silver and gold inks were applied using the flexographic process with the end-of-press tower coater utilizing flexographic print plates after the sheets had been printed with the lithographic process. I was also told that this press would be introduced at the forthcoming IPEX (International Printing Exposition) that was to take place in England in September 1993.

6. We were then escorted into and shown MAN-Roland's training room. This room contained a number of presses, and we were told these presses were disassembled and reassembled to train MAN-Roland's employees and other printing mechanics and installers. In one corner of the training room was a glass enclosed room containing what I recall was a gravure

printing unit, which was also being used for testing purposes. I knew at that time in May 1992 that gravure printing was a specialized process involving a gravure cylinder in which larger volumes of inks could be applied to a substrate. After having seen the end-of-press tower coater with an anilox roller on the prototype MAN-Roland 706 press and the gravure test unit, it occurred to me that my goal of improving the WIMS process by increasing the volume and size of metallic particles used in the process could be obtained by using a tower coater with an anilox roller or a gravure unit up front or as the first station on a lithographic press with the appropriate interstation drying. I disclosed this idea to Gary Doughty, and we discussed keeping it confidential and not disclosing it to the MAN-Roland personnel because we did not know them that well.

7. As the discussions with MAN-Roland's personnel continued, I felt much more comfortable talking to them, especially after recalling that WPC had just filed a patent application on WIMS. Accordingly, in my conversations with Helmuth Pleier and Wolfgang Schweißer, I disclosed my idea to them by asking if the tower coater with an anilox roller could be moved "up front" on the press. In response, Mr. Pleier said that it was possible. We continued our conversation about the feasibility of my ideas with MAN-Roland personnel in a dinner meeting later that evening with Mr. Pleier.

8. Upon my return to the United States, I spoke with Bill Davis and told him of my discovery and initial idea of possible options to improve the WIMS process by using an in-line process with a flexographic unit "up front". The options for an "up front" unit included a dedicated station, a bolt on device like a "T"-Head, or even perhaps a rail traversing the press from which an anilox roller coating assembly could be lowered to any lithographic station, or perhaps even a flexographic station moving sideways into any desired lithographic stations. Bill said that the easiest way to perform the process, in his opinion, was to utilize a modification of a conventional "rack-back", such as made by Dahlgren, Epic, Rapidac or Oxy-Dry, which would be modified for interstation use and equipped with an anilox roller and chambered doctor. Bill indicated to me that my concept of a system traversing over the length of the press with the anilox roller assembly being retractable vertically, while theoretically possible, had special limitations as to WPC only because of ceiling height, and was, therefore, impractical as to WPC. Bill told me that the changeover time with a "T"-Head type was lengthy and that, while it was technically possible, a modified "T"-Head type was not commercially feasible. We decided to

go with Bill's recommendation for a modified rack-back device, and we made several sketches on yellow sheets of how a "rack-back" device could be built for interstation use.

9. Following the MAN-Roland trip, Wolstenholme made substantial efforts, starting in the fall of 1992, to try again to motivate MAN-Roland to use the WIMS technology as a part of its efforts to sell the new Roland 700 at IPEX in England in September 1993. I met with Harry Bowyer with Bill Davis in Dallas on October 18-20, 1992 (See Exhibit A), and again discussed with him what we had to do to convince MAN-Roland to at least try WIMS. Harry Bowyer went back to Offenbach, Germany to visit MAN-Roland in late February 1993, in the week of February 22, 1993 (See Exhibit B), and to the best of my knowledge, tried to motivate MAN-Roland to use WIMS. That effort continued into March 1993. (See Exhibit C, D).

10. I believe that the lacquering press of Figs. 1-2 and the bulk of the '752 patent up to Col. 5, line 55 is nothing other than the Roland 700 prototype I saw in Germany on May 27, 1992. MAN-Roland, to the best of knowledge, first introduced the Roland 700 with a tower coater using an anilox roller to the press in February 1993 (German article in Flexodruck 2-93 at 42-43 and translation, Exhibit E), and very soon thereafter filed a patent application in Germany. To the best of my knowledge, the Roland 700 having an end-of-press tower coater with an anilox roller was first introduced at IPEX in September 1993. The unit displayed did not have a tower coater with an anilox roller – dedicated or otherwise – "up front", but again, only end-of-press. To the best of my knowledge, MAN-Roland has never advertised or sold commercially a lithographic press with such an up front tower coater/flexographic printer.

The undersigned Declarant stated further that all statements made herein of Declarant's own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Jesse Speight Williamson

Date: 9/22/2000

EXHIBIT A

MEMORANDUM

To: Jerry Williamson, Bob Emrick, Roy Adams, Bill Davis, Sherm Sweeney, Gary Doughty, Brad Palmer

From: Jesse Williamson

Date: Oct. 13, 1992

Subject: WOLSTENHOLME BRONZE POWDERS LIMITED

Harry Bowyer is scheduled to be in town on Sunday, October 18, 1992.

We were supposed to have testing for him on the 19th and 20th.

I have gotten with Gary and made sure we have images and we will need to get with our ink company in regards to the powdered inks they sent in. I think we have enough to use that they sent, but they will probably bring some with them as well. This is an excellent chance for us to get our WIMS book going and show them what we can do. I believe that we have all been procrastinating on getting the ball rolling on this, but now time is of the essence.

I will be getting back with each one of you after we get the images ready to separate.

Thank you,

Jesse Williamson
JW:rkb

EXHIBIT B

MEMORANDUM

To: Harry Bowyer (Fax)
Jesse Williamson
Gary Doughty

From: Don Raumaker

Date: 2-16-93

Subject: Conference Report

MEETING DATES: February 8 and 9, 1993 - Dallas, Texas

1. WIMS Brochure

It was agreed dummy/concept may be altered somewhat, to reduce cost, by elimating some images/pages, for coordination with overall effort.

2. IPEX - Birmingham, England

A 10-day show in September 1993 for which Bowyer will provide specifics as to needs, dates, hours, accommodations, et. al. when available that WPC factors may plan, provide and attend accordingly.

3. MAN Roland

a. Wolstenholme International negotiating with subject for no less than 2-days on 6/color press and 2-days on 2/color press with more days if WIMS posters deemed worthy of such by exhibitor(s).

b. Bowyer meeting with Phillipe and Haldinger in Frankfort, Germany week of February 22 to present concepts for posters.

4. Posters

a. Acevedo presented pencils of 6/color and 2/color concepts on "Cowboy" theme for Bowyer's presentation to Roland. Production notes/credits will be created once final versions, specifications, suppliers, manufacturing requirements, etc. all resolve.

b. Bowyer saw presentation by photographer Skeeter Hagler with rep K.J. Hill and took samples, brochures, et. al. for presentation to Roland factors.

c. K.J. having 3-projector/desolve 35MM slides with audio track presentation converted to Beta video-cassette master for Bowyer's use with Roland factors.

d. Raumaker faxing Skeeter's bio to Bowyer's office for presentation to Roland factors.

5. Tentative Schedule

a. By February 26
Bowyer will communicate Roland's response to WPC that other participation possibilities such as Kodak and Crossfield may be contacted by WPC and Zanders (paper) by Wolstenholme.

b. By March 15

(1) WPC will have estimated costs for design, photography, artwork, separations and proofing from specs...to accommodate Roland equipment...and finalized all decisions for WIMS brochure.

(2) Raumaker will have transmitted 35MM color slide of WPC's new web press up and running to Bowyer.

(3) All particulars attendant to accommodating Roland at IPEX will have been fixed.

c. By May 3

(1) Posters, separations and proofing to Roland.

(2) WIMS brochure art press-ready for WPC.

(3) Publicity plan (if any) completed and agreed upon.

d. By June 1

(1) Roland will have completed and packed pre-printing of posters.

(2) WIMS brochure completed.

6. Miscellaneous

a. "Cowboy" thematic approach could be adapted to other materials, exhibitions, et. al., including a 1994 calendar were Zanders to deem worthy of such investment.

b. Bowyer will advise what role, if any, Skeeter's photography, et. al., shall play in total IPEX effort, and/or thereafter.

c. Bowyer will be returning to Dallas in Spring, concerning finalization of all activities and components, when any outstanding decisions, agreements, etc., must resolve.

Thank you,

Don Raumaker

DR:db

cc: Jerry Williamson
Sherm Sweeney
Luis Acevedo (fax)
Don Sibley (fax)

EXHIBIT C

MEMORANDUM

To: Harry Bowyer
~~Jesse Williamson~~
Gary Doughty

From: Don Raumaker

Date: Mar. 9, 1993

Subject: WIMS TRIAD CONFERENCE REPORT

Met this date and finalized following action plan:

I. Selected Skeeter Fagler shots for Roland's Open House test in April.

A. Sources

1. Color slide of [illegible] and boot coming to Luis from K.J. for conversion to B/W
2. B/W print [illegible] coming to Luis from K.J.
3. B/W print of [illegible] with [illegible] coming to Luis from K.J.

B. Costs

1. [illegible]
2. [illegible] separations [illegible]
3. Luis [illegible] to Don.

II. Deadline: Film must [illegible] on or before March 26 for Open House/test printing in April.

III. Sheet/image size [illegible]

IV. Cost Recovery Option

Quantities of what, if any, images printed by Roland may return Dallas for over printing with [illegible] and WIMS copy for possible downline marketing applications.

cc: Kathy Jane Hill
Luis Acevedo

EXHIBIT D

WOLSTENHOLME
INTERNATIONAL

INTERNATIONAL

SPRINGFIELD HOUSE,
P.O. BOX 14, DARWEN,
LANCASHIRE BB3 0RX
ENGLAND.

TEL: (0254) 760099
TELEX: 63251 WOLBRO G
FAX: (0254) 873009

OUR REF: HEB/JB

DATE: 18 March 1993

FACSIMILE TRANSMISSION

TO: JESSIE WILLIAMSON

ATTN: C.C DON RAUMAKER/GARY DOUGHTY

FROM: HARRY BOWYER

NO. OF PAGES INCLUDING FRONT SHEET: 1

ROLANDS TEST PRINT ON TWO COLOUR PRESSES AT GRAPHIC CENTRE

As discussed they require the plain positives for the printing on 22-25th March.

They will then print during w/c 29 March.

The machine size is 50 x 70 cm.

What is the colour sequence?

Also what is the tack sequence, if any?

Regards

HARRY BOWYER

EXHIBIT E

TRANSLATION

FlexoDruck 2-93, 42-43

World premiere in Dortmund: Gold lacquer printing takes the place of metal bronzing

When the editorial board of FlexoDruck received an invitation to the Fritz Busche Druckerei-GmbH to Dortmund, the first through was: What are we supposed to do at an offset printing plant? After a first telephone conversation with GERD RICHTER at Du Pont and a couple of background information items it was soon clear: here a world premiere is to be seen which opens up interesting possibilities also for Flexodruck. There was to be seen a completely new (offset) printing process: Offset gold ink (-farbe) on the basis of aqueous binder appplications in a lacquering tower converted into the Flexoprinting mechanism of a sheet offset machine.

The (offset) technical press was invited on January 28 to a presentation to Dortmund and was able to experience the new development in production as well as pose questions to those participating in the project.

Dr. ANDREAS ALTMEYER, spokesman of the business management of the Busche interprise group explained the enterprise philosphy with

the words: "we are not speaking about ourselves, but we are talking with you. Dialogue is the precondition for the finding of the best solution for an assignment under creative, economic and ecological aspects." He designated KALUS RIETZLER the director of the development division "process technology" as the father of this development. It is to his suggestion that the first considerations go back, the thought, namely, of replacing the conventional laborious and costly bronzing in offset printing by an inline production comparable in effect. (The best results in gold and silver effects, for example on packages or labels were hitherto obtained with the complicated and expensive imprint foil printing, by intaglio printing, in which by use of low-viscosity printing inks the applying of relatively thick color layers is possible or by the likewise technically complicated bronzing process, and which is moreover environment-unfriendly because of the metal pigment dust used.)

In further reports, WERNER RINGEL as plant director spoke about his practical experiences, espcially in dealing with another application technology--Flexo--as well as dealing with an application medium still relatively foreign to the offset printer--the Flexo printing plate. MARTIN LANGE, a board member at MAN-Roland for marketing and service give technical details about the printing machine (a five-color Roland 700 with two lacquering towers in 3b format) and carefully avoided designating the "modified" lacquering tower as a Flexo printing mechanism. ("Contact anxieties" with

another printing process?
Surprisingly, one does count among the well-known offerers of newspaper flexomachines--principally in the USA.)

Astonishing that Du Pont as producer of the Cyrel CL2-M-flexo-printing plate for lacquer application did not open his mouth. Details on the platten type were yielded then in personal conversation with GERD RICHTER and the technical advisor Wilfried Kraft who also looked after the user in its development. Here, the technical data:

CL2-M plate with a PQ surface and a-modified polymer layer, total thickness 0.63 mm on 0.22 mm thick carrier foil, hardness 80-85° Shore A. As substructure, after some tests, decision was made for a full-surface exposed Cyrel PLS plate, 2.54 mm total thickness, hardness 52-54° Shore A. Plate and substructure provide the requisite total thickness of 3.25 mm. Hitherto they had not decided at Busche for a lacquer plate production of their own but had depended rather on the know-how of the specialists at Rudolf Reproflex in Goslar. As is proper for an offset printer, the plates are stretched (also cementing was tried). Here there are still some problems with the "correct" tensioning and a stiffer carrier is desired in order to minimize the minimum

weight (? Passerung) accuracies by distortion in the tensioning.

About the modified lacquering tower with its application system it remains to be remarked: During the presentation the work was still done in the "quasi squeeze operation"; the ink runs out of the ink box between a "rayer" ("Verreiber" and an applicator roller. The final version will comprise a raster roller and a chamber wiper system, which for reasons of type was not yet installed. This part, accordingly is a true flexo-printing mechanism!

What does flexoprinting (Flexodruck) have of this?

According to information of Dipl.-Ing. ANDREA HEINEMANN of the ink manufacturer Michael Huber München GmbH, trials were made, of course, on their own flexoprinting machine in Celle. The results permit the clear statement that this new ink is possible to use on any normal flexoprinting machine. The printer must accustom himelf, of course, to a higher viscosity, which however would lie clearly under the "thickly liquid quality" ("Zähflüssigkeit") of a UV ink.

Great areas of application could be, for example, packages and the label sector which already today are frequently improved with other processes (for example hot-embossing foils). Astonishingly (he said) from the corner of the flexoprinting no demand on the Team has yet been made, so that the development work for this

ink arose on insistence of an offset printer. Now then, now flexoprinting can profit from another printing process.

The ink

In the following section there is reproduced the report of ANDREA HEINEMANN with the most important passages and statements for the technical details of the new Acrylac Gold and Silver Inks.

Today there are various possibilities for achieving promotionally useful metal effects:

--Use of metallized printing materials and laser-functioning printing inks (mainly in the case of bottle labels),

- Bronzing,

- Embossing foil printing,

- Intaglio printing (Tiefdruck).

Each of these processes presents corresponding disadvantages (see Table 1). With the "new" ink there should be linked as few as possible disadvantages, for example additional installations, costs, burdens on the environment) with the best possible advantages (highest metal effect and economy).

Processes	Disadvantages
Metallized printing materials	High printing material costs
Bronzing	Bronzing installation Fouling Dust-removal problems Several passages through machine
Embossing foil printing	Foil embossing installation Recycling Several passages through machine
Intaglio printing	Intaglio printing installation Solvent disposal Balancing (Auslastung)

Table 1

In regard to the parameter metal effect it must be said that two different process are used for the production of aluminum or brass pigments: High-vacuum processes (very expensive and costly, but clearly better metal effect) or grinding.

Through the production process there arises a scattering of the particle size, which again has a decisive influence on the covering capacity and the print-out behavior of the ink: with increasing particle size there are diminished the covering power (but the brilliancy increases) and the print-out behavior (edge sharpness).

The selection of suitable particle sizes can bring about decisive differences in quality.

Besides the influence of the metal pigments, further criteria are decisive for the brilliance of a gold color (or ink) (see Table 2). Aqueous binders make possible a better depositing behavior: the pigmen.... [TEXT BREAKS OFF]

ILLUSTRATION, bottom of page 43

Microphotograph of a gold color (or ink):

Bronzing (left),
Acrylac Gold (middle),
Offset gold (right).

Weltpremiere in Dortmund: Goldlackdruck löst Metall-Bronzierung ab

Als die Redaktion von *Flexo-Druck* eine Einladung zur *Fritz Busche Druckereigesellschaft mbH* nach Dortmund bekam war der erste Gedanke: was sollen wir bei einer Offsetdruckerei? Nach einem ersten Telefonat mit GERD RICHTER bei *Du Pont* und ein paar Hintergrundinformationen war schnell klar: hier wird eine Weltpremiere zu sehen sein, die auch dem Flexodruck interessante Möglichkeiten eröffnet. Zu sehen war ein völlig neues (Offset)-Druckverfahren: *Offsetgoldfarbe auf der Grundlage wäßriger Bindelmittel – aufgetragen in einem zum Flexodruckwerk umgebauten Lackierturm einer Bogenoffsetmaschine.*

Die (Offset)–Fachpresse war am 28. Januar zu einer Vorführung nach Dortmund eingeladen und konnte die Neuentwicklung in Produktion miterleben sowie den Projektbeteiligten Fragen stellen.

Dr. ANDREAS ALTMEYER, Sprecher der Geschaftsführung der *Busche Unternehmensgruppe*, erklärte die Unternehmensphilosophie mit den Worten: "Wir reden nicht über uns, sondern sprechen mit Ihnen. Dialog ist die Voraussetzung zur Findung der besten Lösung für einen Auftrag unter kreativen, wirtschaftlichen und ökologischen Aspekten." Er bezeichnete KLAUS RIETZLER, den Leiter der Entwicklungsabteilung "Verfahrenstechnologie" als Vater dieser Entwicklung. Auf dessen Anregung gehen die ersten Überlegungen zurück, das herkömmliche arbeits- und kostenintensive Bronzieren im Offset durch eine im Effekt vergleichbare Inline-Fertigung zu ersetzen. (Beste Ergebnisse bei Gold- und Silbereffekten z B. auf Verpackungen oder Etiketten erhielt man bis dahin mit dem aufwendigen und kostenintensiven Prägefoliendruck, durch den Tiefdruck, bei dem durch Verwendung niedrigviskoser Druckfarben das Auftragen relativ dicker Farbschichten möglich ist oder durch das ebenfalls technisch aufwendige und zudem durch den eingesetzten Metallpigmentstaub umweltbelastende Bronzieren.)

In weiteren Referaten sprach WERNER RINGEL als Betriebsleiter über seine praktischen Erfahrungen, besonders im Umgang mit einer anderen Auftragstechnologie – Flexo – sowie dem Umgang mit einem dem Offsetdrucker noch relativ fremden Auftragsmedium – der Flexodruckplatte. MARTIN LANGE, bei *MAN-Roland* Vorstandsmitglied für Vertrieb und Service gab technische Details über die Druckmaschine (eine Fünffarben-Roland 700 mit zwei Lacktürmen im 3b-Format) und vermied es sorgsam, den "modifizierten" Lackturm als Flexodruckwerk zu bezeichnen. ("Berührungsängste" mit einem anderen Druckverfahren? Verwunderlich, zählt man doch zu den namhaften Anbietern von Zeitungsflexomaschinen – vornehmlich in den USA.)

Erstaunlich, daß *Du Pont* als Hersteller der eingesetzten *Cyrel CL2-M*-Flexodruckplatte für Lackauftrag nicht zu Wort kam. Einzelheiten zum Plattentyp ergaben sich dann im persönlichen Gespräch mit GERD RICHTER und dem technischen Berater *Wilfried Kraft*, der auch den Anwender bei seiner Entwicklung betreute. Hier die technischen Daten:

CL2-M-Platte mit einer PQ-Oberfläche und einer modifizierten Polymerschicht, Gesamtstärke 0,63 mm auf 0,22 mm starker Trägerfolie, Härte 80-85° Shore A. Als Unterbau entschied man sich nach etlichen Versuchen für eine vollflächig belichtete *Cyrel PLS*-Platte, 2,54 mm Gesamtstärke, Härte 52-54° Shore A. Platte und Unterbau erbringen die erforderliche Totalstärke von 3,25 mm. Bisher entschied man sich bei *Busche* noch nicht für

Pressekonferenz in Dortmund.
Von links nach rechts: Werner Ringel(Busche), Martin Lange (MAN Roland), Gerd Mackensen (verdeckt) und Dr. Andreas Altmeyer (beide Busche), Andrea Heinemann und Harald Weberbauer (beide Michael Huber, München).

Angeregte Diskussion nach der Betriebsbesichtigung.

CA

eine hauseigene Lackplattenherstellung sondern verläßt sich vielmehr auf das Know-how der Fachleute bei *Rudolf Reproflex* in Goslar. Wie es sich für einen Offsetdrucker gehört, werden die Platten gespannt (man hat auch das Kleben versucht) Hier hat man noch etwas Probleme mit dem "korrekten" Spannen und wünscht sich einen steiferen Träger, um Passerungenauigkeiten durch Verzug beim Spannen zu minimieren.

Zum modifizierten Lackturm mit seinem Auftragsystem bleibt anzumerken: Während der Präsentation wurde noch im "quasi Quetschbetrieb" gearbeitet; die Farbe lauft aus dem Farbkasten zwischen eine "Verreiber"- und eine Auftragswalzer Die Endversion wird eine Rasterwalze und ein Kammerrakelsystem umfassen, das aus Zeitgründen noch nicht installiert war. Somit ist dieser Teil ein echtes Flexodruckwerk!

Was hat der Flexodruck davon?

Nach Auskunft von Dipl.-Ing. ANDREA HEINEMANN vom Farbhersteller *Michael Huber München GmbH* wurden natürlich Versuche auch auf der hauseigenen Flexodruckmaschine in Celle gemacht. Die Ergebnisse lassen die klare Aussage zu, daß diese neue Farbe auf jeder normalen Flexodruckmaschine zu verdrucken sei. Der Drucker müsse sich natürlich an eine höhere Viskosität gewöhnen, die aber deutlich unter der "Zähflüssigkeit" einer UV-Farbe liege.

Große Anwendungsbereiche könnten z.B. Verpackungen und der Etikettensektor sein, die schon heute häufig mit anderen Verfahren veredeln (z.B. Heißprägefolien). Erstaunlicherweise sei aus der Ecke des Flexodrucks noch keine Anforderung an das Team herangetragen worden, so daß die Entwicklungsarbeit zu dieser neuen Farbe auf Drängen eines Offsetdruckers entstand. Nun denn, jetzt kann der Flexodruck von einem anderen Druckverfahren profitieren.

Die Farbe

Im folgenden Abschnitt wird das Referat von ANDREA HEINEMANN mit den wichtigsten Passagen und Aussagen zu technischen Details der neuen *Acrylac Gold- und Silberfarben* wiedergegeben.

Heute gibt es verschiedene Möglichkeiten werbewirksame Metalleffekte zu erzielen:
- Einsatz metallisierter Bedruckstoffe und lasierende Druckfarben (hauptäschlich bei Flaschen-Etiketten),
- Bronzierung,
- Prägefoliendruck,
- Tiefdruck.

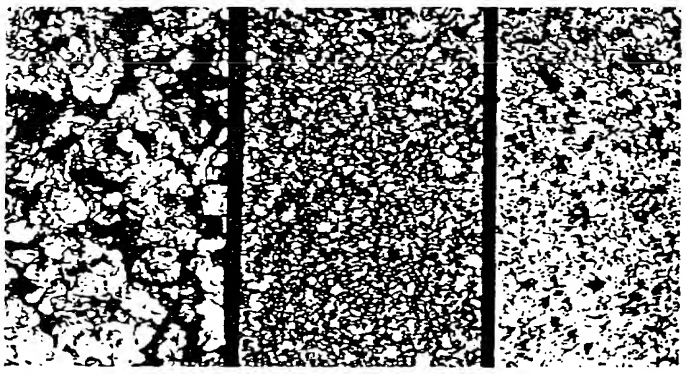
Jedes dieser Verfahren weist entsprechende Nachteile auf (siehe *Tabelle 1*). Bei der "neuen" Farbe sollte möglichst wenig Nachteile z.B. zusätzliche Anlagen, Kosten, Umweltbelastungen) mit den bestmöglichen Vorteilen (höchster Metalleffekt und Wirtschaftlichkeit) verknüpft werden.

Verfahren	Nachteile
Metallisierte Bedruckstoffe	hohe Bedruckstoffkosten
Bronzierung	Bronzieranlage Verschmutzung Abstaubprobleme mehrere Maschinendurchgänge
Prägefoliendruck	Folienprägeanlage Recycling mehrere Maschinendurchgänge
Tiefdruck	Tiefdruckanlage Lösemittelentsorgung Auflastung

Tabelle 1

Zum Parameter Metalleffekt muß gesagt werden, daß zwei unterschiedliche Verfahren zur Herstellung der Aluminium- oder Messing-Pigmente eingesetzt werden: *Hochvakuumverfahren* (sehr aufwendig und teuer, aber deutlich besserer Metalleffekt) oder *Mahlen*. Durch die Herstellung bedingt, entsteht eine Streuung der Teilgröße, die wieder einen entscheidenden Einfluß auf die Deckfähigkeit und das Ausdruckverhalten der Farbe hat: mit zunehmender Teilchengröße verringern sich Deckkraft (aber die Brillanz nimmt zu) und das Ausdruckverhalten (Randschärfe). Die Auswahl geeigneter Teilchengrößen kann als entscheidende Qualitätsunterschiede bringen.

Neben dem Einfluß der Metallpigmente sind weitere Kriterien für die Brillanz einer Goldfarbe entscheidend (siehe *Tabelle 2*). Wäßrige Bindemittel ermöglichen ein besseres Aufschwimmverhalten: die Pigmen-



Mikroaufnahme einer Goldfarbe: Bronzierung (links), Acrylac Gold (Mitte), Offsetgold (rechts).

1/2,AB/2 (Item 2 from file: 351)
DIALOG(R)File 351:DERWENT WPI

008028741 WPI Acc No: 89-293853/41
XRPX Acc No: N89-224145
Inking mechanism for offset printing machine - incorporates additional rollers to apply paste-like coating
Patent Assignee: (POLL) VEB POLYGRAPH LEIPZIG
Author (Inventor): JENTZSCH A; GRAFE F
Number of Patents: 002
Patent Family:

CC	Number	Kind	Date	Week	
DE	3906648	A	891005	8941	(Basic)
DD	282663	A	900919	9108	

Priority Data (CC No Date): DD 313982 (880325)
Applications (CC,No,Date): DE 3906648 (890302)
Abstract (Basic): DE 3906648
The offset printing machine for printing individual sheets has inking mechanisms which apply a low viscosity, water soluble coating to the material which is to be printed. The last inking mechanism (2) of the printing machine applies a coating of a paste-like oil containing substance.

The inking mechanism (2) consists of a printing cylinder (1), a forme cylinder (3), a transfer roller (4) and a profiled roller (5) which is partly immersed in the coating substance and is provided with a wiper blade (7). The coating substance is spread evenly over the transfer roller (4) by smoothing rollers (8).

USE - Offset printing machines. @(4pp Dwg.No.1/3)@
Derwent Class: P74;
Int Pat Class: B41F-005/00; B41F-007/04; B41F-009/00; B41F-023/08; B41F-031/06

D

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Reissue Application of: **BILL L. DAVIS and JESSE S. WILLIAMSON**	§	
For Reissue of U. S. Patent 5,630,363 Issued May 20, 1997 Serial No. 08/515,097	§	Group Art Unit: 2854
Filing Date: May 20, 1999	§	Examiner: S. Funk J. Hilten
Serial No.: 09/315,796	§	
For: **COMBINED LITHOGRAPHIC/ FLEXOGRAPHIC PRINTING APPARATUS AND PROCESS**	§	

DECLARATION OF HARRY BOWYER

To: The Honorable Commission of
Patents and Trademarks
Washington, D C 20231

Sir:

I, Harry Bowyer, declare under penalties of perjury the following:

"1. I am Harry Bowyer, Business Development Director of Wolstenholme International, Ltd. ("Wolstenholme") with a head office at Springfield House, Lower Eccleshill Road, Darwin, Blackburn, Lancashire BB3 0RP, England. I am over 21 years of age, have never been convicted of a felony, and am competent to make this testimony.

"2. In October 1991, I was Business Development Manager of Wolstenholme, and Williamson Printing Corporation ("WPC") was a potential customer of Wolstenholme. In October 1991, I first visited WPC in Dallas, Texas to discuss working together on the "WIMS" process. The "WIMS" process, I now understand, is described in U.S. Patent 5,370,976, a copy of which is attached hereto as Exhibit A. At that time WPC was urging Wolstenholme to help WPC produce brighter metallic with its WIMS process.

"3. In May of 1992, I arranged a special trip requested by Jesse Williamson and WPC for Jesse to visit a number of facilities in Germany in regard to the WIMS process. A copy of Jesse's itinerary is attached hereto as Exhibit B. Jesse was accompanied by Gary Doughty of Classic Color, a company owned by WPC, and myself. We visited various color separation facilities in Germany, including Reuffuth GmbH (Mühlheim, May 26), Eder Repro Offset (Stuttgart, May 27) and

Witteman & Küppers GmbH & Co. (Frankfurt, May 26). We spent many hours, both inside and outside of the car as we drove around Germany discussing the current restrictions with the use of metallic offset ink. The issue of having the metallics last through the press in WIMS was discussed as a problem. I showed a book to Jesse Williamson that showed printing gold with silk screening, flexo, gravure and offset. Jesse stated that the current waterbased flexo units would be great if they could be put down earlier on in the chain, and I said that this would resolve a lot of the issues around the metallic effect. We visited MAN-Roland GmbH on Wednesday, May 27, 1992 in Offenbach and Jesse put forward to me a concept of a front-end flexographic coater. This concept must also have been discussed with both Wolfgang Schweisser and Helmuth Plier, both of MAN-Roland. Although I do not recall all of the details of what Jesse discussed with Wolfgang and/or Helmut, I can say to a moral certainty that he disclosed to them his concept of having a flexographic step early in the lithographic printing process so as to have a continuous in-line process. To the best of my knowledge, such a conversation and disclosure did take place. We also spent a long time in the automobile after the MAN-Roland visit discussing this concept. The MAN-Roland visit was primarily to promote the use of WIMS, and the use of our WIMS image at the forthcoming IPEX Exhibition in September 1993. As the visit was arranged by myself for Jesse to specifically talk to Roland, we also did discuss WIMS.

"4. During the rest of 1992, we worked on WIMS metallic images for IPEX 1993 and also with the "Take a Ride with WIMS" brochure produced for Drupa 1995. I visited Dallas and WPC in October 1992, and Bill Davis and Jesse Williamson again went over the concept of going "up front" with an anilox flexographic printer/coater, mentioning that it could be accomplished by a dedicated station, an auxiliary "rack back" device or a "T-head". They wanted MAN-Roland to use WIMS and adapt their concept of going "up front" with an anilox roller. Throughout this period we were running waterbased flexo inks along with metallic offset ink. I discussed with MAN-Roland, in February 1993, the desirability of having a flexographic step "up front" in a lithographic press.

"5. Very shortly afterwards, to the best of my knowledge, WPC embarked on the development of products which would meet this new process. I visited MAN-Roland in late February 1993 and spoke with them on numerous occasions leading up to the IPEX Exhibition in September 1993. I urged MAN-Roland to utilize the WIMS technology. Appreciable efforts were made on my part to urge MAN-Roland to adopt WPC's WIMS technology.

"6. Attached as Exhibit C is a report on my visit to MAN-Roland in February 1993 where I made a specific reference to running a WIMS image on their tower coater on a Roland '706 press. This was part of the effort to motivate MAN-Roland to make such an attempt for the IPEX Exhibition.

"7. U.S. Patent 5,630,363, Exhibit D hereto, contains a more detailed description of the process disclosed to me in the automobile and outside the automobile by Jesse Williamson in May 1992, as well as to MAN-Roland GmbH. To whatever extent this process of having a flexographic step "up front" in the lithographic process is disclosed in U.S. Patent 5,638,752 to MAN-Roland, Exhibit E, it is my belief that the MAN-Roland disclosure originated from Jesse Williamson during the trip to MAN-Roland in Offenbach on May 27, 1992."

"8. The '363 patent appears to me to pertain to the Roland 706 "Plus Single Coater" with an anilox roller introduced at the IPEX Exhibition in England in September 1993. The Roland 700 series was launched at the DRUPA conference in the spring of 1990. A double coater was introduced by Roland at DRUPA in the spring of 1995.

The undersigned Declarant stated further that all statements made herein of Declarant's own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Harry E Bowyer

Harry Bowyer

14-09-00

Date:

EXHIBIT A

US005370976A

United States Patent [19]

Williamson et al.

[11] Patent Number: 5,370,976

[45] Date of Patent: Dec. 6, 1994

[54] METALLIC COLOR PRINTING PROCESS

[75] Inventors: **Jesse S. Williamson**, Dallas; **George V. Barnaby**, Irving; **Gary V. Doughty**, Dallas, all of Tex.

[73] Assignee: **Williamson Printing Corporation**, Dallas, Tex.

[21] Appl. No.: **887,510**

[22] Filed: **May 22, 1992**

[51] **Int. Cl.**[5] G03C 7/00; G03C 5/00; G03F 9/00; H04N 1/21

[52] **U.S. Cl.** **430/358**; 430/359; 430/22; 430/30; 358/798; 358/534, 358/536

[58] **Field of Search** ..... 430/358, 359, 30, 293, 430/301, 21, 143, 43, 44, 347; 106/19 R; 358/75, 80, 534, 536, 298

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Primary Examiner—Charles L. Bowers, Jr

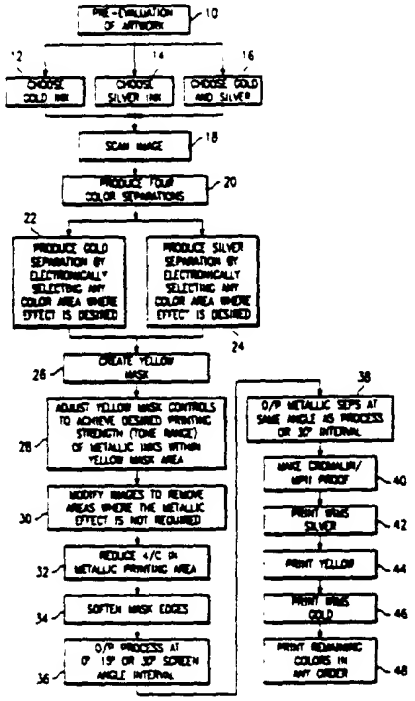
Assistant Examiner—J. Pasterczyk

Attorney, Agent, or Firm—Jones, Day, Reavis & Pogue

[57] **ABSTRACT**

A method of reproducing on a substrate an image incorporating metallic inks involves scanning (**18**) the image to be reproduced and creating (**20**) four color separations of the scanned image. Metallic gold and/or metallic silver color separations (**22**, **24**) are created by electronically selecting any color area where the effect is desired. Next, the color separations are edited by creating (**26**) an electronic yellow mask of the image and adjusting (**28**) the desired tonal range of the metallic areas. The mask edges of each color separation can also be softened (**34**). The scanner then outputs (**36**, **38**) the separations to film. The image is then reproduced by printing each of the process color separation films (**44**, **48**) and the metallic separation films (**42**, **46**) onto a substrate.

12 Claims, 2 Drawing Sheets



CONFIDENTIAL
SUBJECT TO
PROTECTIVE ORDER

W001119

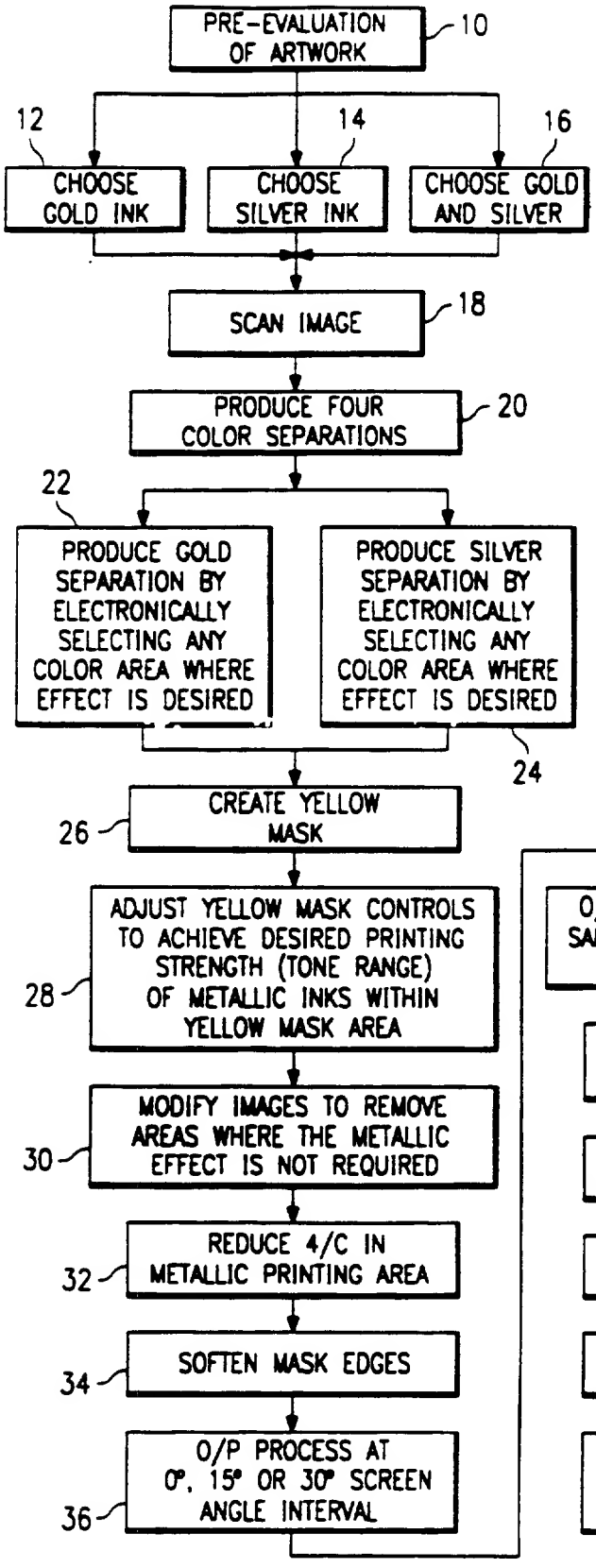


FIG. 1

W001120

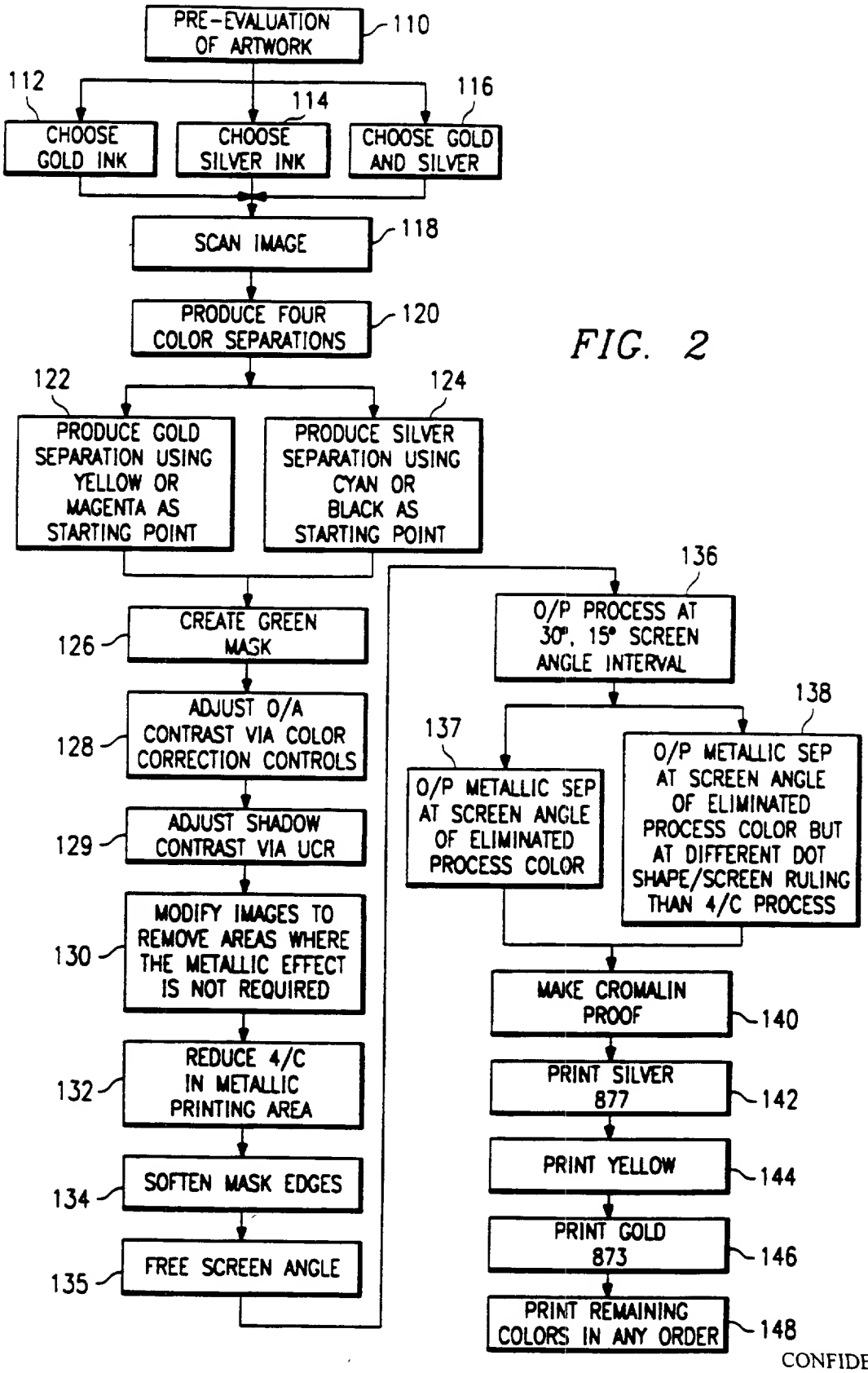


FIG. 2

W001121

METALLIC COLOR PRINTING PROCESS

TECHNICAL FIELD OF THE INVENTION

The present invention relates to a metallic color printing process. Specifically, this method produces an improved metallic image by printing the subtractive primary colors, black, metallic gold and/or metallic silver at four screen angles.

BACKGROUND OF THE INVENTION

The reproduction of color was first achieved by Scottish physicist James Maxwell in the mid 1850's. Maxwell photographed a scene three times, once through a red filter, once through a green filter, and once through a blue filter. These black-and-white negatives were contacted to produce positives that were then mounted as slides. Each slide was placed in a different projector and the images were focused together on a screen. A red, green, or blue filter was placed over the lens of each respective projector, thus producing a color image on the screen.

The first single film image for color photography was produced by Louis Ducos du Huron in France in the late 1860's. In his system, the image on a black-and-white panchromatic emulsion was broken up by a series of red, green, and blue transparent dots or lines that formed a screen in front of the emulsion. The dots and lines were so small that they could not be resolved by the eye. After exposure, the film was reversal-processed to yield a colored positive transparency. The additive-color transparency is still used by the Polaroid Corporation with their 35-ram Polachrome slide process.

The development of the subtractive color systems was also pioneered by du Huron. He suggested making separation negatives through red, green, and blue filters, then making positive transparencies from each, dyeing them with colors that absorb each respective primary color (i.e. cyan, magenta, and yellow). This subtractive method is difficult to use because it requires the accurate registration of the colored positives or the accurate registration of images from dyed positive matrices. The solution was a three-emulsion film, each layer made sensitive to a different color (red, green, or blue) and then dyed a different color (cyan, magenta, or yellow) in processing. The first successful film of this type was Kodachrome, introduced by the Eastman Kodak Company in 1935.

Printed color reproduction is based on many of the same principles as film color reproduction. Instead of a continuous image, allowed by the film medium, a series of dots are printed on a substrate. These dots are printed in the subtractive primary colors of cyan, magenta, and yellow. Additionally, black is used to adjust the contrast of the image. In the subtractive process, a white substrate is used and red, green, and blue are essentially subtracted to achieve black. By contrast, in the additive system, a black background (i.e. a blank TV screen) is used, and red, green, and blue are added to achieve white. In the additive system the following combinations create the following results:

Red + Green = Yellow
Red + Blue = Magenta
Green + Blue = Cyan
Red + Green + Blue = White

In the subtractive process, the following is true:

White − Yellow − Cyan = Green
White − Magenta − Cyan = Blue
White − Magenta − Yellow = Red
White − Yellow − Magenta − Cyan = Black

Moreover, each subtractive primary color when added with white produces that same subtractive primary color.

The objective in printing is to produce yellow, magenta, and cyan printing plates that are negative records of the amounts of blue, green, and red in the original. This is achieved by first photographing the original, in turn, through blue, green, and red filters. These films may then be converted into a halftone dot image suitable for a given printing process. The films are then used to make the image carriers, which may be plates, cylinders, or stencils. Each plate is inked with its appropriate ink, which is then transferred to a white substrate.

The image produced is largely dependant upon dot size and orientation. Orientation is defined primarily by the screen angle of the dot. The screen angle is the angle at which the rulings of a halftone screen are set when making screened images. In other words, the screen angle of a dot is the angle of the line which bisects the often elliptical dots. Standard screen angles have been established for various colors of dots: Magenta (45°), Cyan (75°), Yellow (90°), Black (105°). The interaction of screen angle, color, and dot size effect the quality of the reproduction.

Printing metallic colors, such as metallic gold and metallic silver, poses additional problems. Gold has typically been treated as a shade of yellow, while silver has been treated as a shade of gray. Thus the brilliance of these colors is diminished by the blending of hues which occurs in a four color printing system.

A system known as Metallic Integrated Printing Process (MIPP) has been developed for the reproduction of metallic colors by Eckart-Werke Metal Pigments and Powders of Furth, Bayern, Germany. This system requires numerous steps. First, a designer marks-up the artwork to be copied to designate those areas where the MIPP system is required, i.e. metallic colored areas. Next, a conventional four color separation is produced of the artwork. Each separation is then compared to the original artwork to see which separation gives the best representation of the metallic colors. Based on the object color in the original photograph and the color requirements of the final print, a determination is then made whether gold or silver is required. Most shades of gold can be obtained from silver and yellow. However, a high percentage of yellow on silver greatly reduces the metallic brilliance. In addition, silver has a grey value of approximately 30% that tends also to reduce the metallic brilliance and thereby dirty colors.

After the four color separations are made, two separations used to print the metallic inks must be developed from two of the four separations. Typically the cyan or black separation will give the best basis for developing the silver separation and either the yellow or magenta for the gold separation. The selected separations are then duplicated to become the gold and silver separations. These separations may require modification to remove image areas where a metallic effect is not required. Comparison with the original transparency may indicate the need to enhance some image areas so as to improve the final metallic effect. The MIPP system anticipates the softening of mask edges of the metallic colors to avoid sharp cut-out effects when the final result is printed. In practice, the task of softening of

mask edges can be handled using electronic image processing equipment.

With the MIPP systemic, a screen angle must be freed for each of the metallic inks to avoid problems of screen clash and resulting moire effects. This can be accomplished by using achromatic or Under Color Removal, ("UCR") color separation techniques where the process color with the lowest value is eliminated in favor of black. UCR involves the technique of reducing the cyan, magenta, and yellow content in neutral grey shadow areas of a reproduction and replacing them with black ink so that the reproduction will appear normal but will use less process color ink. (From the Complete Color Glossary by Miles Southworth, Thad McIlroy and Donna Southworth, Copyright 1992; Published by The Color Resource, Livonia, N.Y. ISBN 1-879847-01-9). Often the cyan will have the lowest value and is the color to eliminate. Since both gold and silver have a process color value, the four conventional separations will need to be modified if the finished print is not to look over-colored or dirty. For example PANTONE 873, the MIPP gold standard, has a process color value of approximately 65% yellow, 25% magenta and 5% cyan. So if the gold areas are to look realistic these colors must be reduced proportionately The separations may also require modification as the metallic inks have a grey scale value and a failure to take this into account may result in a dirtying of the final colors due to a reduction in their metallic brilliance

A MIPP image is printed using standard screen angle intervals of 30° or 15° The screen angle used for a metallic ink is the same as that for the process colors eliminated in favor of a metallic ink. The MIPP system may use different dot shapes to reduce the risk of screen clash. A round dot, with no preferred direction, is typically used for the metallic ink, while an elliptical dot works for the standard process inks. The color standards chosen for MIPP come from the PANTONE System of matched metallic inks, with PANTONE 873 as the gold standard and PANTONE 877 as the silver standard.

Because metallic inks are opaque, they are normally printed before the transparent process colors. But with MIPP the sequence is changed slightly so that the first three colors down are silver, yellow, and gold, respectively. The remaining three process colors are printed in any order. The first three colors, in this order, are very important if the finished print is to look realistic. The use of yellow on silver is necessary to obtain yellow, green and orange metallic effects. Yellow, under gold, is also necessary to maintain the correct tonal values in the highlight areas. Yellow, printed in this way, provides a transition from gold to non-metallic pans of the image. On the other hand, if yellow is printed on top of the gold, there is a loss of metallic sheen without any compensating color benefit.

In summary, the MIPP system presents several disadvantages. First, it requires excessive handwork to create the color mash. Second, the MIPP system requires the elimination of one of the subtractive process colors to free up a screen angle for a metallic color. Third, the MIPP system only allows the printing of four screened colors in any given area. Last, the PMS 873 standard gold ink used by the MIPP system is a dirty, or less brilliant gold ink. This dirty look limits the gold color reproduction to the inherent dirty look even if no other color ink is printed in that area. This dirty look also necessitates additional color correction of the sub tractive primaries. Therefore, a need exists for a printing process which maximizes the appearance of metallic colors. Such a process should allow the use of six colors printed at four screen angles Moreover, such a process should not limit the number of colors in any given area to four as with the MIPP System.

SUMMARY OF THE INVENTION

The present invention relates to the Williamson Integrated Metallic System (WIMS) developed to allow six color printing using yellow, magenta, cyan, black, metallic silver, and/or metallic gold. The WIMS System creates a realistic metallic gold or metallic silver effect using the subtractive primary colors, black, silver and-/or gold. The WIMS method comprises a number of steps. The subject to be reproduced is first scanned by a standard scanner and four color separations are created The original art is then edited to achieve the required metallic effect. Editing comprises the steps of creating a yellow mask, reviewing an electronic version of the image produced by the scanner, determining the amount of contrast between heavy and light metallic regions on the image by one skilled in the art based on past experience, and then sending that contrast information back to the scanner. A "yellow mask" is created to isolate areas where a metallic effect is desired. This "yellow mask" allows the operator to select these areas based on the color and tonal region of the original. For example, those areas appearing neutral are appropriate for silver metallic, while those areas appearing high yellow with a red component are appropriate for the gold metallic. Additional modification of dot size in these isolated areas may be required to avoid moire and reduction in metallic brilliance of the final colors. These colors can be printed at four screen angles: cyan (75°), magenta (45°), silver (45°), gold (75°), yellow (90°), and black (105°).

In the WIMS System, a cleaner, or more brilliant gold color ink is used, wherein the process color value is less than 25% for magenta and less than 5% for cyan This should diminish any dirtiness caused by the process color values of adjacent primary colors. Additionally, any harsh edge effects caused during printing may be softened during the electronic masking stage. During printing, the silver separation can be printed at the same screen angle as the magenta, while the gold separation can be printed at the same screen angle as the cyan separation.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention, and for further details and advantages thereof, reference is now made to the following Detailed Description taken in conjunction with the accompanying drawings, in which:

FIG. 1 illustrates a flow chart of the WIMS System for reproduction of metallic color; and

FIG. 2 illustrates a flow chart of the prior art MIPP System.

DETAILED DESCRIPTION OF THE DRAWINGS

The present invention relates to a metallic color printing process, also known as the WIMS System, that overcomes many of the disadvantages found in the prior art. Referring to FIG. 1, a flow chart illustrates the steps involved in the present method.

A first step involves pre-evaluation at step 10 of the subject to determine desired effects and proper placement of metallics in process reproduction. Metallic gold can be chosen at step 12, metallic silver can be chosen at step 14, or a combination of both metallic gold and metallic silver can be chosen at step 16. Next, the image can be scanned at step 18 by a scanner which, in turn, produces at step 20 four color separations which are electronically viewed on the scanner display. The scanner acts as both an input device and an output device. In other words, the artwork is input to the scanner. The scanner can then output color separations or film used to recreate the artwork. The scanning step involves the application of 75% to 100% to the scanner set-up and the scanning of the image. Then, the PCR is removed from the scanner set-up and the image is scanned to an "Imagedit", an electronic color correction machine, produced by the Crosfield Co. of Hemel Hempstead, England

The original artwork is evaluated in a well known manner by one skilled in the art to determine the color areas in which the metallic effect is desired. A gold separation can be produced at step 22 by electronically selecting any color area where the effect is desired Likewise, a silver separation can be produced at step 24 by electronically selecting any color area where the effect is desired. Typically, the cyan or black areas of the original art will be the basis for developing the silver printing whereas yellow or magenta areas of the original art will form the starting point for creating the gold printing It is emphasized that either the gold or silver separations may be produced by selecting any color area where the effect is desired.

Using the Crosfield Imagedit, a "yellow mask" can then be created at step 26 to isolate the areas where a metallic effect is desired from the rest of the separation. The "yellow mask" function gives the ability to select the desired areas electronically based on the tonal region or bandwidth of the original as well as the desired color region. Creating a yellow mask entails several steps First, an electronic version of the image produced by the scanner displays the contrast between a heavy metallic region and a light metallic region on the image. For example, neutrals are appropriate for silver, while high yellows with a red component are appropriate for gold. The yellow mask controls can be adjusted at step 28 to achieve desired printing strength (tonal range) of metallic inks within the yellow mask area. These controls allow the adjustment of slope, gain, and rolloff of the image within the yellow mask area.

Next, the Imagedit computer creates six revised color separations in a well-known manner; one each for yellow, cyan, magenta, black, gold and silver. Once these electronic masks are created, further modification at step 30 of the isolated area may be required. For example, such modifications may increase or reduce the printing dot size of the metallic separation and/or adjust at step 32 the amount of four color process ink printing over the newly created metallic to compensate for the reduction in brilliance caused by the additional metallic color in the reproduction. Additionally, in a given original, there may be areas of similar color where a metallic effect is desired in one area but not the other. For example, a gold watch requires a, metallic gold, while a golden retriever would not. Due to this anomaly, further electronic manipulation of the image may be required to eliminate metallic ink in unwanted areas. Moreover, because all masking is performed electronically, it is possible to soften at step 34 any harsh edge effects in the final reproduction via mask smoothing or tonal integration techniques

Next, this information is sent back to the scanner which outputs at step 36 the subtractive process colors and the metallic separations. The MIPP standard for screening is to eliminate (by hand masking) one of the process colors in metallic areas to free-up a screen angle, or to produce the metallic separations at a line screen resolution different than the process colors to reduce moire effects. However, in the WIMS process, the subtractive process colors are output at step 36 at 0°, 15°, and/or 30° screen angle intervals. An interval is the spacing between any two screen angles. The metallic color separations are output at step 38 at the same angles as the subtractive process colors or at 30° intervals The gold separation can be produced at the same screen angle as the cyan separation. Likewise, the silver separation can be produced at the same angle as the magenta separation. Therefore, with WIMS reproductions, six colors can be printed at four screen angles. For example, cyan can be printed at 75°, magenta at 45°, silver at 45°, gold at 75°, yellow at 90°, and black at 105°. Both process and metallic separations are produced at the same line screen resolution. Typically, there are no problems with moire effect.

The next step involves metallic inks, a gold ink, a silver ink, or both gold and silver. The Pantone MIPP standard for gold ink is PMS 873 This ink printed solid has a process color value of approximately 65% yellow, 25% magenta and 5% cyan. For WIMS reproduction, however, a much more brilliant gold ink is used, wherein the magenta and cyan process equivalents are greatly reduced. This was selected under the rationale that a pure gold ink area of WIMS gold could be reduced in brilliance, but a pure PMS 873 ink area could not be made any more brilliant than the inherent bronze color of the ink This same color compensation theory also applies to silver areas where a calculated reduction in cyan or black generally occurs.

Prepress proofing at step 40 is accomplished via a combination of 3M Matchprint II (for process colors) and Dupont Cromalin (for metallics). After proofing, the artwork is reproduced by first printing at step 42 the WIMS standard for silver, then printing at step 44 yellow, then printing at step 46 the WIMS standard for gold, and finally printing at step 48 the remaining subtractive primary colors in any order.

FIG. 2 provides a flow chart of the MIPP process which is discussed in greater detail in the Background Section. In sum, the designer marks up the artwork to be reproduced to show where MIPP is required and the image is scanned at step 118. Based on the object color in the original photograph and the color requirements of the final print, a determination is then made whether to choose at step 112 gold, choose at step 114 silver, or to choose at step 116 both silver and gold. The artwork is then scanned at step 118 by a scanner and a standard four-color separation is produced at step 120. Each separation is compared to the original to determine which gives the best representation of the metallic colors. A gold separation is next produced at step 122 using the screen angle of the process color that was eliminated in that area, as will be discussed in greater detail. Likewise, a silver separation can also be produced at step 124 using the screen angle of the process color that was eliminated in that area.

A green mask is created at step **126** with the scanner and viewed on the scanner display. The overall contrast of the green mask can be adjusted at step **128** via the color correction controls. Shadow contrast can then be adjusted via undercolor removal (UCR). Next, the image is modified at step **130** to remove areas where the metallic effect is not required. The level of the four subtractive process colors can be reduced at step **132** in the metallic printing area. Mask edges can then be softened at step **134**.

Next, a screen angle must be freed at step **135** for each of the metallic inks to avoid problems of screen clash and resulting moire effects. In other words, in any one area where a metallic ink is used, the subtractive primary color with the same screen angle must be eliminated or made solid. Thus, no more than four screened colors may appear in any one area of the reproduction. The scanner outputs at step **136** the subtractive process colors to film at 30° and 15° intervals. The scanner can then output at step **137** the metallic separations at a screen angle of an eliminated process color. Alternatively, the scanner can output at step **138** the metallic separations at the screen angle of the eliminated process color but at a different dot shape and/or screen ruling than the four subtractive process colors. Prepress proofing at step **140** is accomplished. After proofing, the artwork is reproduced by first printing at step **142** the PMS 877 standard for silver, then printing at step **144** yellow, then printing at step **146** the PMS 873 standard for gold, and finally printing at step **148** the subtractive primary colors in any order.

Although preferred embodiments of the invention have been described in the foregoing Detailed Description and illustrated in the accompanying drawings, it will be understood that the invention is not limited to the embodiments disclosed, but is capable of numerous rearrangements, modifications, and substitutions of parts and elements without departing from the spirit of the invention. Accordingly, the present invention is intended to encompass such rearrangements, modifications, and substitutions of parts and elements as fall within the scope of the invention.

We claim:

1 In a method of half-tone dot printing a reproduction of a scanned image on a substrate with the four subtractive process colors of magenta, cyan, yellow, and black in a given area of the scanned image at only four screen angles, an improved method of incorporating metallic colors in said reproduction, the improvement comprising the steps of:

printing at least one metallic color in said given area at a selected one of the only four screen angles; and

printing at least one of said four subtractive process colors in said given area at the same screen angle as said at least one metallic color such that said at least one metallic color and one process color are printed in said given area at the same one of said four screen angles so as to enable at least five colors to be printed at only said four screen angles.

2 A method as in claim **1** further including the steps of

printing a second metallic color in said given area at a second one of said four screen angles; and

printing a second one of said four subtractive process colors in said given area at the same second one of said four screen angles as said second metallic color so as to have an additional metallic color and an additional process color printed in said given area at said second one of said four screen angles so that up to six colors are printed at only said four screen angles.

3 The method of claim **1** of reproducing a scanned image on a substrate including incorporating metallic colors and further comprising the steps of

producing four process color separations of the scanned image, each at one of said four screen angles,

producing at least one metallic color separation at the same screen angle as a corresponding first one of the four screen angles of the process color separations in said given area,

editing each process color separation and the at least one metallic color separation to obtain metallic color separation information;

outputting each process color separation to film creating a process color separation film,

outputting the at least one metallic color separation to film creating a first metallic color separation film, and

printing a reproduction of the scanned image on a substrate using the process color separation films and the at least one metallic color separation film such that both a metallic color separation and a process color separation are produced at the same screen angle.

4 The method of claim **3** of reproducing a scanned image on a substrate including metallic colors anti further comprising the steps of

producing a second metallic color separation at the same screen angle as a corresponding second one of the four screen angles of the process color separations in said given area,

editing the second metallic color separation to obtain metallic color separation information,

outputting the second metallic color separation to film creating a second metallic color separation film, and

printing a reproduction of the scanned image on a substrate using the process color separation film and the first and second metallic color separation films such that said first metallic color separation and a first process color separation are produced at an identical first screen angle and the second metallic color separation and second process color separation are produced at a second identical screen angle so as to enable up to six colors to be printed in the given area in only four screen angles.

5. The method of claim **4** wherein the step of producing a first and a second metallic color separation further comprises the steps of:

producing a gold metallic color separation as the first metallic color separation; and

producing a silver metallic color separation as the second metallic color separation.

6 The method of claim **4** wherein the step of producing a first and a second metallic color separation further comprises the steps of:

producing a silver metallic color separation as the first metallic color separation; and

producing a gold metallic color separation as the second metallic color separation.

7 The method of claim **4** wherein the step of editing further comprises the steps of:

reviewing an electronic version of the scanned image to determine regions of the image where metallic color is to be added;

creating a yellow mask for the given area to enable isolation of any region therein where metallic color is to be printed,

electronically adjusting the amount of contrast between the isolated regions to achieve a desired metallic color contrast between said isolated regions so as to obtain metallic color separation information, and

sending the metallic color separation information back to the scanner to provide half-tone dot signals.

8. The method of claim 4 wherein the step of outputting the at least one metallic color separation further comprises the step of outputting the first metallic color separation at the same screen angle as a first process color separation or at a 0°, 15°, or 30° interval therefrom

9 The method of claim 4 wherein the step of outputting the second metallic color separation further comprises the step of outputting the second metallic color separation at the same screen angle as a second process color separation or at a 0°, 15°, or 30° interval therefrom

10 The method of claim 3 wherein the step of editing further comprises softening an image edge of the process color separations and metallic color separations

11 The method of claim 3 wherein the step of outputting the process color separations comprises outputting the process color separations onto film at 0°, 15°, or 30° screen angle intervals.

12. The method of claim 1 wherein the step of printing comprises:

(a) printing the metallic silver onto the substrate,

(b) printing yellow onto the substrate;

(c) printing the metallic gold onto the substrate,

(d) printing the remaining colors onto the substrate in any order

* * * * *

EXHIBIT B

Wolstenholme Bronze Powders Limited

Springfield House,
P.O. Box 14, Darwen,
Lancashire, BB3 0RX,
England.

Telephone: (0254) 873777
Telex: 63251 WOLBRO G
Fax: (0254) 873009

DEN/SW

21st May, 1992.

FOR FACSIMILE TRANSMISSION

TO: CLASSIC COLOR, DALLAS, TEXAS

ATTENTION: MR. GARY DOUGHTY

Dear Gary,

Hope these are now the final details :

	HOTEL
SATURDAY 23RD MAY	
GD/JW - arrive Frankurt.	Novotel, Offenbach Strahlenberger Strasse 12 Kaiserlei (tel: 49 69 820040)
SUNDAY 24TH MAY	
GD/JW - Frankfurt	Novotel, Offenbach
MONDAY 25TH MAY	
GD/JW - Frankfurt	Novotel, Offenbach
HEB - arrive Frankfurt, flight LH4097, depart 17:00, arrive 19:30 hours.	"
GD/JW/HEB - meet up for drinks/chat - evening	
TUESDAY 26TH MAY	
10:00 REUFFUTH GMBH, Herr Reuffuth (tel: 49 610 86224)	Novotel, Offenbach
(Possibly accompanied by Herr Pleier or Herr Schweisser - from MAN Roland, as Herr Reuffuth's English is limited)	

CONFIDENTIAL
SUBJECT TO
PROTECTIVE ORDER

W000027

Cont .../2

OTEL
NFO:

May 23-27 (Sat.-Wed.)

Novotel, Offenbach
Strahlenberger Strasse 12
Kaiserlei
Ph# 49 69 820040

May 28 - 29 (Thurs. ~~&~~ Fri)

The Last Drop Hotel
Bromley Cross, Bolton
Ph# 44 204 301131

May 30 (~~Fri.~~ Sat.)

Royal Horseguards Thistle
Whitehall Court
London
Ph# 071 839 3400

VENTS:

May 25 (Mon.)

Meet Harry Bowyer for drinks/chat - evening

May 26 (Tues.)

10:00 a.m. Reuffuth GMBH, Herr Reuffuth
ph#49 610 86224

1:00 p.m. Whittemann & Kueppers GMBH
Herr Harald Kueppers
ph# 49 69 23 8020

May 27 (Wed.)

11:00 a.m. Eder Repros Offset-Repro GMBH
Herr Inno Eder (owner)
ph# 49 71 58 5011

3:00 p.m. MAN Roland, Herr Helmuth Pleier
ph# 49 69 83050 or 49 69 8305 2808

May 28 (Thurs.)

10:00 a.m. Crosfield Electronics Limited
Tony Johnson, UK Sales
Chris Baker, USA Sales
ph# 44 442 230000

Evening dinner w/Harry and Paul Fallon

May 29 (Fri.)
W. Contex, Manchester

Cont .../2

Drive to Wittemann & Kueppers

13:00 WITTEMANN & KUEPPERS GMBH, Novotel, Offenbach
Herr Harald Kueppers
(tel: 49 69 23 80 20)

No plans made, as yet, for evening

WEDNESDAY 27TH MAY

Drive to Stuttgart (Harry will be hiring a car)

11:00 EDER REPROS OFFSET-REPRO GMBH Novotel, Offenbach
Herr Inno Eder (owner)
(tel: 49 71 58 5011)

Drive to Frankfurt

15:00 (Sorry time on first issued itinerary - typing error!)
MAN ROLAND, Herr Helmuth Pleier
(tel: 49 69 83050 - reception
49 69 8305 2808 - direct to Pleier)

Possible dinner in evening with Helmuth Pleier

THURSDAY 28TH MAY

Fly Frankfurt - Heathrow - Flight No. BA901, depart 08:00 arrive 08:40 hours (FLIGHT COST = £201.10 EACH).

Harry's car will be at airport.

Drive to Hemel Hempstead

10:00 - 10:30 CROSFIELD ELECTRONICS LIMITED,
Tony Johnson, UK Sales
Chris Baker, USA Sales
(tel: 44 442 230000)

To discuss:
(1) MIPP - specific equipment
(2) What's new in Crosfield
etc.

To include lunch and demonstration

Cont .../3

Cont .../3

Afternoon Drive to Lancashire

The Last Drop Hotel
Bromley Cross, BOLTON
(tel: 44 204 301131)
Booked under
Wolstenholme, and charged
at our corporate rate.
Account to be settled on
departure.

Evening Dinner, with Harry and Paul Fallon
(our Ink & Operations Director).

FRIDAY 29TH MAY

A.M. Our chauffeur to drive you to W.CONTEX, MANCHESTER.

PLEASE ADVISE FULL ADDRESS AND TIMES FOR THIS MEETING.

P.M. Our chauffeur then to collect you and bring you back to Wolstenholme offices to meet personnel and hold discussions.

PLEASE ADVISE APPROX. TIME FOR COLLECTION.

The Last Drop Hotel

Possible free evening. N.B. The hotel you are staying, i.e. The Last Drop Hotel, is a beautiful 'village' with leisure facilities, small shops, pubs and restaurant.
This evening's 'entertainment' can be discussed at a later date.

SATURDAY 30TH MAY

Morning train to LONDON, EUSTON. Either our chauffeur of myself will drive you to the train station.
We shall book 1st class tickets for this journey. Cost will be advised at a later date.

PLEASE ADVISE 'SMOKING' OR 'NON-SMOKING' SEATS.

Upon arrival at London, Euston station, you will be able to take a taxi to your hotel ROYAL HORSEGUARDS THISTLE

(Copy of booking form herewith for your information, including telephone number).

Cont .../4

Cont .../4

SUNDAY 31ST MAY

Two options (1) Taxi to Gatwick Airport
(2) Taxi to Victoria train station, then train to Gatwick Airport (I believe this is a very short journey by train).

Hope these details suit you well. Any last minute questions, please ask Harry as I shall be away from the office (nice weather again!!)

Enjoy a safe and pleasant journey.

Kind regards,

DAWN NICHOLSON.

P.S.

HARRY WILL HAVE WITH HIM YOUR FRANKFURT FLIGHT TICKETS.

I'LL HOLD ON TO YOUR RAIL TICKETS.

) MAY 1992 16:49 From 071 328 8021 Room Centre (UK) To 0254873009 P.1

CLIENT CONFIRMATION
Booking number: 215141
Date of booking: 20-May-92

When making, amending or cancelling a reservation please ensure that you quote your company code :

WOLDAR

Expotel contact: CHERYL JONES Expotel (Stockport)
Tel: 061-431-8000 Fax: 061-443-1381

Your reservation is at: Royal Horseguards Thistle
Whitehall Court
Hotel reference: London
WASIN 20/05/92
Telephone no:
071 839 3400 SW1A 2EJ

---

01) 1 DBSO Sat 30-May-92 1nts
MR J WILLIAMSON 105.00 GBP +B
02) 1 Single room with private bath Sat 30-May-92 1nts
MR B DOUGHTY 89.00 GBP +B

Account: Client to settle own account

Booking guaranteed for late arrival

Client ref: DAWN NICHOLSON
WOLSTENHOLME BRONZE POWDERS LIMITED
SPRINGFIELD HOUSE
PO BOX 14
DARWEN
LANCASHIRE
BB3 0RX

Please amend or cancel through Expotel / Room Centre

EXHIBIT C

HB/KW/MIN/CIRCFILE/VISIT CWS IPF/..SG

VISIT REPORT FROM HARRY BOWYER **25TH FEBRUARY 1993**

MAN ROLAND
OFFENBACH
GERMANY

PRESENT: Wolfgang Schweisser - Rolands
Helmut Plier - Rolands
Wolfgang Walenski - Zanders

Apologies: Ewe Philippe - Graphispak

SUBJECT:

To discuss subject matters for printing at IPEX '93 in Birmingham.

SUMMARY

Ipex

Both Helmut Plier and Wolfgang Walenski are fairly strong on the theme and images (see note in detail on Wolfgang Walenski). Wolfgang Schweisser (top man) is very polite but was indecisive due to the massive cut-backs Rolands re facing in promotional budget. This is a positive thing as they will be more selective in what to do. If Helmut Plier and Wolfgang Walenski can exert some pressure on Ewe Philippe they would go big on it.

There is an 'open house' at Rolands Graphic Centre week 13. They have selected 3 of Hagler's photos to run on black/silver on various Zanders/ papers. The open house is for 2 colour presses primarily. Following the results of those the format will be decided upon.

Water based gold coatings

We discussed at some length the situation at Busche and Rolands have asked us to participate in a demonstration week at their graphic centre week 16 or 17 (to be confirmed) when they will test various water based gold coatings on their Rolands 706 TL press with single coater.
They would also like to test a heavy metal free gold!

ACTION:

HEB to contact Jesse Williamson to arrange separations and to confirm to Helmut Plier week 13 ok.
Completed 23.2.93

HEB to raise TE to Paul Fallon to formulate and supply water based gold to run at Rolands week 16/17
Completed 23.2.93

HEB to set up project team on U/P gold coatings.
Completed 23.2.93

Harry Bowyer

EXHIBIT D

US005630363A

United States Patent [19]

Davis et al.

[11] Patent Number: 5,630,363

[45] Date of Patent: May 20, 1997

[54] **COMBINED LITHOGRAPHIC/ FLEXOGRAPHIC PRINTING APPARATUS AND PROCESS**

[75] Inventors: **Bill L. Davis**, Irving; **Jesse S. Williamson**, Dallas, both of Tex.

[73] Assignee: **Williamson Printing Corporation**, Dallas, Tex.

[21] Appl. No.: 515,097

[22] Filed: Aug. 14, 1995

[51] Int. Cl.[6] B41M 1/18; B41M 7/00; B41M 1/04; B41F 23/00

[52] U.S. Cl. 101/141; 101/181; 101/183; 101/424.1; 101/424.2; 101/479; 101/483; 101/491; 101/DIG. 49

[58] Field of Search ..... 101/135–138, 101/141–143, 450.1, 174, 180, 181, 183, 416.1, 424.1, 424.2, 479, 491, DIG. 29, DIG. 49, 483

[56] **References Cited**

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4,796,556	1/1989	Bird	118/46
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5,144,419	9/1992	Nakatsuka et al.	358/75
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5,184,556	2/1993	Schaeuble	101/483
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OTHER PUBLICATIONS

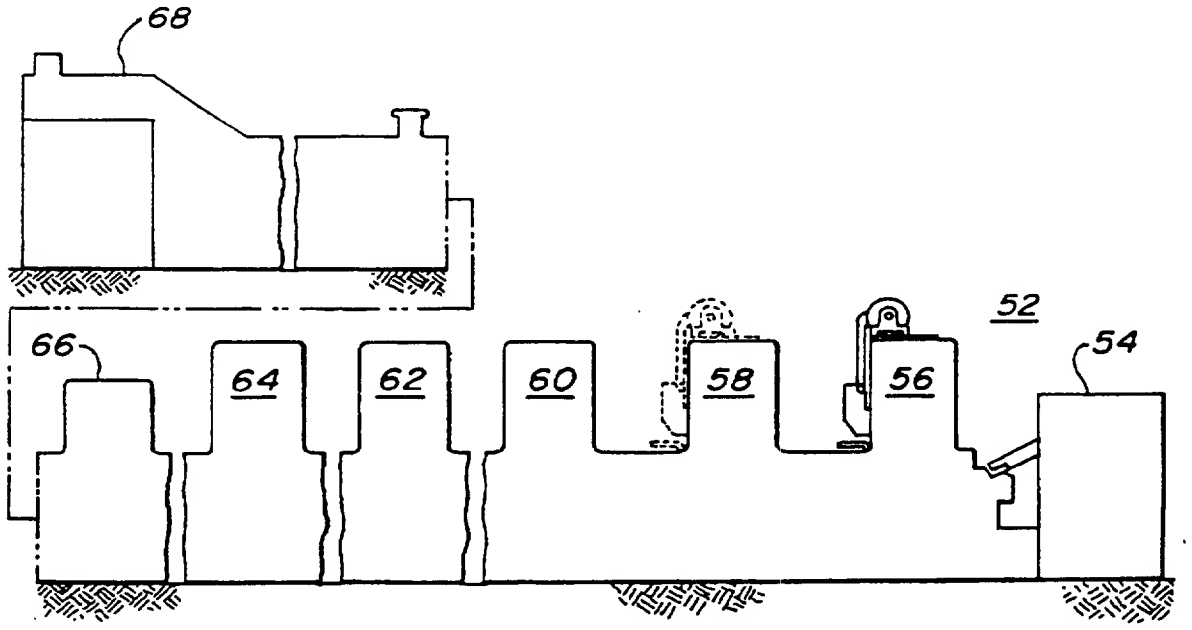
"Pontone® Metallic Integrated Process Color Selector, Pantone Metallic–Buntdruck–Farbskala", The Pantone Library of Color, 201 Pantone, Inc. 1990, pp. MIPP VI–VIII.

Primary Examiner—Stephen R. Funk
Attorney, Agent, or Firm—Jones, Day, Reavis & Pogue

[57] **ABSTRACT**

A combined lithographic/flexographic printing process having a plurality of successive printing stations for printing color images on a substrate in a continuous in-line process. One of the stations prints a first color image using the flexographic process and at least one of the successive printing stations prints a second color image over the first color image using an offset lithographic process in the continuous in-line process.

41 Claims, 1 Drawing Sheet



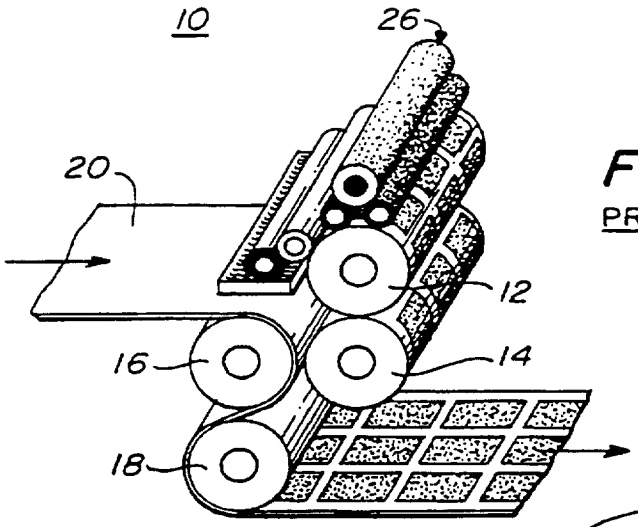


FIG. 1
PRIOR ART

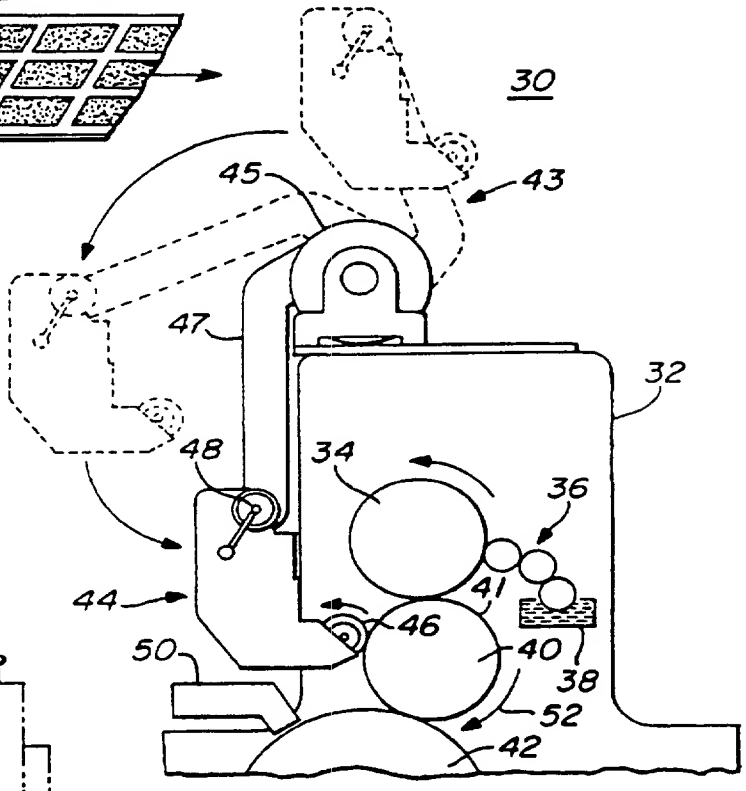


FIG. 2

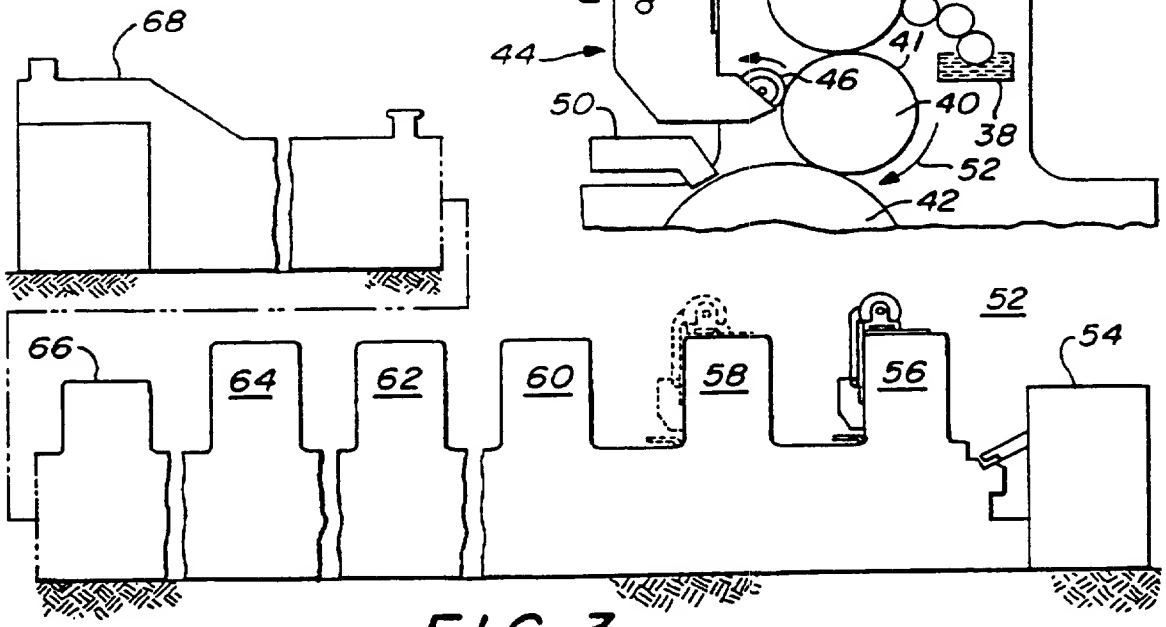


FIG. 3

condition that results when wet ink on the surface of the press sheets transfers or sticks to the backs of other sheets in the delivery pile.

Thus, in summary, conventional lithographic offset printing machines or presses comprise one or more image printing stations each having a printing roller or a plate cylinder to which is fastened a thin hydrophilic, oleophobic printing plate having image areas which are oleophilic and hydrophobic and background areas which are oleophobic and hydrophilic. The plate surface is continuously wetted with an aqueous damping solution which adheres only to the background areas and inked with oleo-resinous inks which adhere only to the image areas of the plate as wet ink. The ink is offset transferred to the rubber surface of a contacting blanket cylinder and then retransferred to the receptive surface of a copy web or a succession of copy sheets, such as paper, with an impression cylinder and the ink air dries by oxidation and curing after passing through a drying station.

It is also known to provide the printing machine with a downstream coating station having a blanket roller associated with a coating application unit for the application of an overall protective coating over the entire printed area of the copy sheets or web.

It is known to apply pattern coatings of protective composition by means of blanket rolls by cutting into the rubber surface of the blanket to create raised or relief surface areas which selectively receive the coating composition from the application roll for retransfer to selected areas of the copy sheets in form of pattern coatings. See U.S. Pat. No. 4,796,556.

Lithographic inks are formulated to print from planographic surfaces which use the principle that grease and water do not mix. Lithographic inks are generally very strong in color value to compensate for the lesser amount applied. They are among the strongest of all inks. The average amount of ink transferred to the paper is about half that of letter press because of the double split of the ink film between the plate cylinder and the blanket cylinder and the blanket cylinder and the substrate on the impression cylinder.

Problems occur in the offset lithographic process when attempting to print certain colors such as white and in particular white on other colors such as yellow because the color white will be faint and not sufficiently strong. In such cases, the sheet or paper or substrate requiring the white ink usually has to be run through the same printer several times before the white becomes sufficiently strong.

Further, such colors are not generally printable in an offset lithographic printing process. This means that the sheets or substrate must be removed and transferred to a second type of machine using the flexographic process to apply greater amounts of ink in successive printing runs to achieve the desired print quality.

A like situation occurs with the printing of slurry-type materials such as "scratch-and-sniff" materials which is a liquid vehicle with a slurry containing an encapsulated essence. Such liquid vehicles, because of the nature of the slurry, must be printed with a flexographic process because the anilox roller can supply greater amounts of ink to the flexo plate on the plate cylinder.

Again, when a liquid vehicle with a slurry having suspended material therein such as metallic particles is to be printed, an offset lithographic process cannot be used without the mixing of the aqueous solution with metallic inks which cause a dulling of the image. Further, the above-mentioned double split of the ink film adds to the dulling of the image. Therefore, to achieve desired results, the printing must take place with a flexographic printing machine.

Thus, liquid opaque coatings or inks such as white colored ink, scratch-and-sniff vehicles, and slurries with metal particles do not achieve desired results when printed in an offset lithographic process and must be transferred from the offset lithographic in-line machines to a separate machine for printing in a separate run.

Such requirements not only hinder the speed of the printing process but also require additional time and thus increase the cost of the printing.

It would be advantageous to have a continuous in-line process in which not only offset lithographic printing could take place but in which, in the same in-line process, liquid printing vehicles including opaque coatings, such as white ink, and slurries containing encapsulated essences or metallic particles could also be printed and dried not only before the printing of the offset lithographic inks but also in which, after the liquid opaque coatings have been applied, an overcoating could be applied to the printed liquid vehicle image using the lithographic process in the continuous in-line process.

SUMMARY OF THE INVENTION

The present invention provides for a continuous in-line printing process having a plurality of successive printing stations for printing color images on a substrate. At least one of the stations prints a liquid vehicle image on a substrate with an opaque coating using the flexographic process and at least one of the successive printing stations printing a second color image over the liquid vehicle image on the printed substrate using the lithographic process in the continuous in-line process.

In the novel inventive system, a single in-line continuous printing process is used. One of the stations may print a liquid vehicle image on a substrate that contains a slurry with an encapsulated essence therein utilizing the flexographic process. Another one of the stations may apply an overcoating over the liquid vehicle image on the printed substrate using a lithographic process. Still another of the stations may print an aqueous-based vehicle image including a suspended metallic material therein using the flexographic process to form a metallic coating and thereafter at least one of the successive printing stations prints a color image over the aqueous-based vehicle image using the lithographic offset process in the continuous in-line process.

Whenever a station is used for flexographic printing, a flexographic plate image is placed on the blanket cylinder for receiving the liquid vehicle and transferring the liquid vehicle to the impression cylinder for printing. An anilox roller is associated with the flexographic plate for supplying the liquid vehicle which may be an aqueous-based vehicle.

In addition, in such case, a high-velocity air dryer is associated with the impression cylinder of one or more of the printing stations where the printing on the substrate is occurring to assist in drying the ink or liquid vehicle printed on the substrate while it is on or near the impression cylinder, before the substrate arrives at the next successive station for additional printing, or before printing occurs at the next successive station.

Thus, if a liquid vehicle such as white ink is to be printed, it is printed with a flexographic process which deposits a greater amount of ink on the substrate, the ink is dried with a high-velocity air dryer while the substrate is on or near the impression cylinder and prior to the substrate being received by the next successive station. If desired, at the next successive station the printing of the white liquid vehicle may again take place thus ensuring the desired intensity of

whiteness on the substrate. Subsequently, at the next succeeding station a printing may take place on top of the white printing and such printing may continue at the remaining successive stations.

Thus, it is an object of the present invention to provide a plurality of successive printing stations for printing color images on a substrate in a continuous in-line process and in which some of the stations print using the flexographic process and other of the stations print utilizing the offset lithographic process.

It is also an object of the present invention to print an aqueous-based vehicle image including a suspended metallic material therein using the flexographic process at one printing station and at least one successive printing station printing a color image over the aqueous-based vehicle image using a lithographic process in a continuous in-line process or placing an overcoating over the aqueous-based vehicle image using the flexographic process and then printing at successive stations using the lithographic process.

It is yet another object of the present invention to provide a continuous in-line printing process in which one of the stations prints a liquid vehicle image on the substrate with a slurry containing an encapsulated essence using the flexographic process and at least one of the successive printing stations applies an overcoating over the liquid vehicle image on the printed substrate using the offset lithographic process in a continuous in-line process.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the present invention will be more fully disclosed when taken in conjunction with the following DETAILED DESCRIPTION OF THE PRESENT INVENTION in which like numerals represent like elements and in which:

FIG. 1 is a schematic view of a prior art offset lithography printing station;

FIG. 2 is a generalized depiction of a printing station that may be used either as an offset lithographic station or a flexographic printing station and illustrates how the station may be converted from an offset lithographic station to a flexographic station; and

FIG. 3 illustrates the continuous in-line process of the present invention comprising a plurality of printing stations, each of which can be converted from an offset lithographic printing station to a flexographic printing station as well as a final coating station.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

FIG. 1 is a schematic representation of a well-known offset lithography printing station 10 having a plate cylinder 12, a blanket cylinder 14, and an impression cylinder 16. The printing medium or substrate, such as paper 20 either in sheet form or web, is fed over the impression cylinder 16 in printing contact with the blanket cylinder 14 to receive the image and then passes over the paper transfer cylinder 18 with the image printed thereon. An inking system 26, well known in the art, transfers the ink from the ink supply to the plate cylinder 12. This is a typical offset lithography printing station.

As disclosed in U.S. Pat. No. 4,796,556, offset lithographic printing machines generally have a plurality of in-line liquid application stations at least one of which is an ink image printing station for printing lithographic ink images on to suitable receptive copy sheets. The final downstream liquid application station is a coating application station for printing a protective and/or aesthetic coating over selected portions of or over the entire ink-image printed surface of the copy sheets and can also be used to print metallic coatings or slurry. As stated in U.S. Pat. No. 4,796,556, two liquid application stations are shown, the latter including a coating apparatus and the first station being a conventional offset image printing station. The coating application printing station is one that can be modified to convert it either permanently or intermittently to a coating station from an offset lithographic station.

Such a station is illustrated in FIG. 2 herein. The station 30 comprises a housing 32 which includes therein a plate cylinder 34 that is fed with an ink system of rollers 36 that take ink from an ink supply 38 and transfer it to the plate cylinder 34. A blanket cylinder 40 is in ink transfer relationship with the plate cylinder 34 and the impression cylinder 42 where the image is transferred to a substrate passing between blanket cylinder 40 and impression cylinder 42 as blanket cylinder 40 rotates in the direction of arrow 52. This is a conventional offset lithographic printing station. When it is desired to convert that station into a coater station, the coater apparatus 43 has a coater head 44 including a supply of liquid coating and an anilox roller 46 that can be moved such that it can be in contact with either the blanket cylinder 40 for direct printing or the plate cylinder 34 for offset printing. In this case, the ink rollers 36 for the lithographic system are removed from engagement with the plate cylinder 34 in a well-known manner. The coater unit 43 includes a motor device 45, an arm 47, and a pivotal connection 48 that connects the coater head 44 with the remainder of the assembly.

As stated previously, the offset lithographic machine of FIG. 2 is converted as shown therein to a coater that is used only in the last stage of an in-line printing process. It has not been able to be used in stages other than the last printing station because the ink that is placed on the blanket cylinder by means of an anilox roller is still wet when it arrives at the subsequent stations, thus causing smearing of the printed material and causing a general impossibility of printing other information thereon. However, applicant has modified the station shown in FIG. 2 by the addition of a high-velocity air dryer 50 that is associated with the impression cylinder 42 directly after the ink is transferred from the blanket cylinder to the substrate on the impression cylinder. Thus by using flexographic inks, or aqueous coatings which are naturally quick-drying inks, and the high-velocity air dryer 50 located at the point where the ink is applied to the substrate on the impression cylinder, the ink is sufficiently dried when it passes to the next station that further printing can take place on the printed substrate.

Thus, as shown in FIG. 3, a conventional in-line offset lithographic printing machine 52 is shown having an apparatus to feed paper into the said machine, referred to as a feeder 54, printing stations 56, 58, 60, 62, and 64 and a coating station 66. A delivery station 68 receives the printed material or substrates. Thus there are a plurality of successive printing stations 56, 58, 60, 62, and 64 for printing color images on the substrate in a continuous in-line process. Any one of the printing stations 56–64 can be modified as generally shown therein and as illustrated in FIG. 2 to print a first color image using the flexographic process. The succeeding printing stations can then print a second color image over the first color image using the lithographic process in the continuous in-line process. As illustrated in FIG. 2, the flexographic process printing station includes the blanket cylinder 40 and the impression cylinder 42. A

flexographic plate 41 on the blanket cylinder 40 has an image thereon for receiving the first color from the anilox roller 46 and transferring that first color image to the impression cylinder 42 for printing on the substrate. The high-velocity air dryer 50 thus dries the flexographic ink on the substrate and passes the substrate to the subsequent printing station. Thus in FIG. 3, station 56 may be modified as generally shown therein and as illustrated in FIG. 2 and a flexographic ink can be printed thereon at station 56, dried by the high-velocity air dryer 50, and coupled to subsequent in-line stations 58–64 for further printing a second or more color images over the first color image using the offset lithographic process in a continuous in-line process. The flexographic printing station shown in FIG. 2 may print a liquid vehicle image on the substrate with a slurry containing an encapsulated essence. At at least one of the successive printing stations 58–64 an overcoating may be applied over the liquid vehicle image on the printed substrate using the flexographic process in the continuous in-line process. The overcoating may be an aqueous overcoating, or an ultraviolet overcoating. In addition, the substrate may be a sheet or a web 20 as illustrated in FIG. 1 or it may be single sheet fed in the continuous in-line process from the stack sheets shown at 54 in FIG. 3.

Further, the modified flexographic printing station 30 shown in FIG. 2, as stated previously, may be any one of the stations 56–64 in FIG. 3, and as illustrated by stations 56 and 58, and may print an aqueous-based vehicle image including a suspended metallic material therein using the flexographic process to form a metallic coating. Again, after it is dried by the high-velocity air dryer 50, it may be passed to one of the successive printing stations for printing a color image over the aqueous-based vehicle image using the offset lithographic process in the continuous in-line process. The suspended material may include uniform-sized metal particles to form the metallic coating or it may include nonuniform or multiple-sized metal particles to form the metallic coating.

The present invention is especially useful when a liquid opaque coating must be printed such as a white color ink. In that case, it may be desirable to have both stations 56 and 58 modified as shown in FIG. 3 and as illustrated in detail in FIG. 2. In such case, the anilox roller 46 at each station delivers the white ink in the same pattern to the flexographic plate 41 on the blanket cylinder 40 for transfer to the substrate on the impression cylinder 42. As the substrate passes the high-velocity drying station 50, the ink is dried and the second station may again print the same white pattern on the substrate to increase the quality of the white ink appearance after it is applied to the substrate.

Thus, the station or stations that are converted to flexographic printing stations may have an ink-providing means 46 at the printing station for applying a flexographic ink to the blanket cylinder to form the image. A substrate receives the flexographic ink image transfer from the blanket cylinder and at least one subsequent printing station in the in-line process receives the image-printed substrate and prints an additional coated ink image on the substrate on top of the flexographic ink image using offset lithography. The additional colored ink images that can be printed on top of the flexographic ink images can be conventional lithographic inks or waterless inks.

Further, the colored ink images may be printed with halftone screening processes. The flexographic ink image and the colored ink images may also be printed in solids and/or halftone printing plates in sequence and in registry in successive printing stations to produce a multicolored image on the substrate. Further, the printing apparatus may include a sheetfed press or a web press.

In the present invention, at least one of the flexographic printing stations prints an image with liquid vehicle slurry containing an encapsulated essence. In another embodiment, at least one of the printing stations prints an image with a water-based liquid vehicle containing suspended particles that are either uniform or nonuniform in size. The suspended particles may be metallic particles up to substantially 16 microns in diameter.

The present invention may also use the metallic color printing process as disclosed in commonly assigned U.S. Pat. No. 5,370,976 incorporated herein by reference in its entirety.

In one aspect, the novelty of the present invention is to create a flexographic printing station that can be used at one of a plurality of printing stations in a continuous in-line process and in which, at a subsequent printing station, a lithographic process may be used to print over the liquid vehicle printed by the flexographic station.

Thus, there has been disclosed an apparatus for a combined lithographic/flexographic printing process that includes a plurality of successive printing stations for printing color images on a substrate in a continuous in-line process and wherein one of the stations prints a first color image using the flexographic process and at least one of the successive printing stations prints a second color image over the first color image using the lithographic process in the continuous in-line process.

While the invention has been described in connection with a preferred embodiment, it is not intended to limit the scope of the invention to the particular form set forth, but, on the contrary, it is intended to cover such alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

We claim:

1. Apparatus for a combined lithographic/flexographic printing process comprising:

a substrate;

a plurality of successive printing stations for printing color images on the substrate in a continuous in-line process;

one of said stations comprising a flexographic printing station for printing a liquid vehicle image on said substrate with a slurry containing an encapsulated essence using the flexographic process;

at least one of said successive printing stations being a lithographic printing station; and

an overcoating applied over the liquid vehicle image on the printed substrate at at least one of said successive lithographic printing stations using the lithographic process in said continuous in-line process.

2. Apparatus as in claim 1 wherein said overcoating is an aqueous overcoating.

3. Apparatus as in claim 1 wherein said overcoating is an ultraviolet ink overcoating.

4. Apparatus as in claim 1 wherein:

said substrate is a paper sheet; and

said apparatus includes a sheet feeder.

5. Apparatus as in claim 1 wherein:

said substrate is a web; and

said apparatus includes a web feeder.

6. Apparatus for a combined lithographic/flexographic printing process comprising:

a plurality of successive printing stations for printing color images on a substrate in a continuous in-line process;

one of said stations comprising a flexographic printing station printing an aqueous-based vehicle image using the flexographic process to form a metallic coating;

a suspended metallic material being included in said aqueous-based vehicle image; and

at least one of the successive printing stations comprising an offset lithographic printing station printing a color image over the aqueous-based vehicle image using the offset lithographic process in said continuous in-line process.

7. Apparatus as in claim 6 wherein said suspended material includes uniform-sized metal particles to form said metallic coating.

8. Apparatus as in claim 6 wherein said suspended material includes nonuniform-sized metal particles to form said metallic coating.

9. Apparatus as in claim 6 further including: said flexographic printing station including a plate cylinder having a flexographic plate thereon, a blanket cylinder, and an impression cylinder;

a flexographic plate image transferred from said plate cylinder to said blanket cylinder, said image being formed of said metallic coating, said blanket cylinder transferring said metallic coating to said impression cylinder for printing said flexographic plate image on said substrate; and

an anilox roller associated with said flexographic plate for supplying said aqueous-based vehicle containing said suspended metallic material to said flexographic plate.

10. Apparatus for creating a combined lithographic/flexographic printing process comprising:

a plurality of successive printing stations for printing color images on a substrate in a continuous in-line process;

one of said stations comprising a flexographic printing station for printing a first color image using the flexographic process; and

at least one of the successive printing stations comprising an offset lithographic printing station for printing a second color image over the first color image using the offset lithographic process in said continuous in-line process.

11. Apparatus as in claim 10 further including:

said flexographic printing station including a plate cylinder, a blanket cylinder, and an impression cylinder;

a flexographic plate on said plate cylinder;

an anilox roller associated with said flexographic plate for supplying a first color to said flexographic plate to form said first color image; and

said blanket cylinder receiving said first color image from said plate cylinder and transferring said first color image to said impression cylinder for printing on said substrate.

12. Apparatus for creating a combined lithographic/flexographic printing process comprising:

a substrate;

a plurality of successive printing stations for printing color images on the substrate in a continuous in-line process;

at least two successive ones of said printing stations being flexography stations and comprising:

(1) a supply of liquid coating;

(2) a plate cylinder associated with a blanket cylinder, said plate cylinder having a flexographic plate thereon;

(3) an anilox roller associated with said liquid supply coating and said plate cylinder for delivering said liquid coating to said flexographic plate to form an image for transfer to said blanket cylinder;

(4) an impression cylinder for receiving said liquid coating image transferred from said blanket cylinder and printing said image on said substrate, said at least two flexography stations printing the same liquid coating image in sequence and in superimposed relationship; and

at least one offset lithographic printing station for receiving said substrate and printing over said liquid coating image.

13. Apparatus as in claim 12 wherein said liquid coating image printed on said substrate is a white color ink.

14. Apparatus as in claim 12 further including an air dryer associated with each of said impression cylinders on said flexography stations, said air dryer having sufficient air velocity for drying said liquid coating before the substrate is transferred to the successive printing station in said continuous in-line process.

15. Apparatus for a combined lithographic/flexographic printing process comprising:

a plurality of successive printing stations for printing color images on a substrate in a continuous in-line process, said printing stations including both lithographic and flexographic printing stations;

a blanket cylinder at at least a first one of said flexographic printing stations;

flexographic ink-providing means at said at least first one of said flexographic printing stations for applying a flexographic ink to said blanket cylinder to form an image;

a substrate for receiving said flexographic ink image transferred from said blanket cylinder; and

at least one subsequent lithographic printing station in said in-line process for receiving said image printed substrate and printing an additional colored ink image on said substrate on top of said flexographic ink image using offset lithography.

16. Apparatus as in claim 15 further comprising:

a plate cylinder at said at least first one of said flexographic stations;

a flexographic plate on said plate cylinder for receiving and transferring said flexographic ink to said blanket cylinder; and

said flexographic ink-providing means including a flexographic ink supply and an anilox roller associated with said flexographic ink supply for transferring said flexographic ink to said flexographic plate.

17. Apparatus for a combined lithographic/flexographic printing process for printing a multicolored image comprising:

a plurality of successive printing stations for printing color on a substrate in a continuous in-line process, said printing stations including both lithographic and flexographic printing stations;

at least one of said flexographic printing stations having:

(1) a plate cylinder and a blanket cylinder, said plate cylinder including a flexographic plate having an image thereon for transferring a flexographic color ink image to said blanket cylinder;

(2) an etched anilox roller for applying a flexographic color ink to said flexographic plate on said plate cylinder;

(3) an impression cylinder in ink-transfer relationship with said blanket cylinder for transferring said flexographic color ink image from said blanket cylinder to said substrate; and

at least one of said succeeding printing stations being a lithographic printing station using offset lithography for printing additional colored ink images on top of said flexographic ink image.

18. Apparatus as in claim 17 wherein said additional colored ink images are formed with lithographic inks.

19. Apparatus as in claim 17 wherein said colored ink images are formed with waterless inks.

20. Apparatus as in claim 17 further including an air dryer adjacent to said impression cylinder for drying the flexographic ink image transferred to said substrate before said additional colored ink images are printed thereon.

21. Apparatus as in claim 17 further including halftone printing plates for printing said colored ink images.

22. Apparatus as in claim 17 wherein said flexographic ink image and said colored ink images are printed as solid colors and/or with halftone printing plates in sequence and in registry in said successive printing stations to produce said multicolored image on said substrate.

23. Apparatus as in claim 17 wherein said printing apparatus includes a sheet-fed press.

24. Apparatus as in claim 17 wherein at least one of said flexographic printing stations prints said flexographic ink image with liquid vehicle slurry containing an encapsulated essence.

25. Apparatus as in claim 17 wherein at least one of said printing stations prints said flexographic ink image with a water-based liquid vehicle containing suspended particles.

26. Apparatus as in claim 25 wherein said suspended particles are uniform in size.

27. Apparatus as in claim 25 wherein said suspended particles are nonuniform in size.

28. Apparatus as in claim 25 wherein said suspended particles are metallic particles.

29. A method of combining lithography and flexographic printing in a continuous in-line process comprising the steps of:

providing a plurality of successive lithographic/flexographic printing stations for printing colored ink images on a substrate;

printing a flexographic ink image on said substrate at at least one of said flexographic stations;

transferring said printed substrate to at least one subsequent printing station in said continuous in-line process; and

printing colored ink images on top of said flexographic ink image at at least one of said subsequent lithographic printing stations with an offset lithographic process.

30. A method as in claim 29 further comprising the step of drying said flexographic ink image on said substrate with an air dryer prior to printing said colored ink images thereon.

31. A method as in claim 29 further including the step of printing a coating on top of said colored ink images at one of said plurality of subsequent printing stations.

32. A method as in claim 29 wherein said colored inks forming said colored ink images are waterless.

33. A method as in claim 29 wherein said colored inks forming said colored ink images are in a solvent-based liquid vehicle.

34. A method as in claim 29 further including the steps of:

printing a slurry on said substrate at any of said printing stations in said continuous in-line process;

using an encapsulated essence in said slurry; and

printing an overcoating over said slurry at a subsequent printing station in said in-line process to protect said essence.

35. A method as in claim 34 further including the step of printing an aqueous-based coating over said slurry.

36. A method as in claim 34 further including the step of printing an ultraviolet coating over said slurry.

37. A method of combining offset lithography and flexographic printing in a continuous in-line process comprising the steps of:

providing a substrate;

applying a flexographic ink to a blanket cylinder in a pattern with a coating head at a first flexographic printing station;

transferring said pattern of flexographic ink from said blanket cylinder to the substrate; and

printing a waterless ink pattern over said flexographic ink pattern on said substrate at at least one subsequent offset lithographic printing station in said continuous in-line process.

38. A method of combining lithography and flexographic printing in a continuous in-line process comprising the steps of:

printing an aqueous-based vehicle image having suspended particles therein on a substrate at a first flexographic printing station;

transferring said image printed substrate to at least one additional printing station in said continuous in-line process; and

printing additional colored ink images on said printed substrate over said aqueous-based vehicle image in an offset lithographic process at said at least one additional printing station in said in-line process.

39. A method of combining lithography and flexographic printing in a continuous in-line process comprising the steps of:

(1) providing a plurality of successive printing stations for printing liquid vehicle images on a substrate in said in-line continuous process;

(2) utilizing an anilox roller to transfer a liquid ink as said liquid vehicle to a flexographic plate image at at least one of said printing stations;

(3) printing said liquid ink from said flexographic plate image to a substrate;

(4) transferring said printed substrate with said liquid ink image to a subsequent printing station in said in-line printing process;

(5) repeating steps (2)–(4) at subsequent printing stations in said in-line process to achieve a desired opacity ink image on said substrate; and

(6) printing an ink pattern over said flexographic ink image using an offset lithographic process.

40. A method as in claim 39 further including the step of additionally printing colored ink images over said liquid ink image on said substrate at subsequent ones of said printing stations in said in-line process.

41. A method as in claim 40 wherein said liquid ink is an opaque white color.

* * * * *

EXHIBIT E

US005638752A

United States Patent [19]

Hartung et al.

[11] Patent Number: 5,638,752

[45] Date of Patent: Jun. 17, 1997

[54] **MULTI-COLOR OFFSET PRINTING PRESS FOR PRINTING AND IN-LINE COATING**

[75] Inventors: **Georg Hartung**, Seligenstadt; **Ulrich Jung**, Limburg; **Jurgen Schneider**, Frankfurt am Main, all of Germany

[73] Assignee: **MAN Roland Druckmaschinen AG**, Germany

[21] Appl. No.: **507,846**

[22] Filed: **Jul. 27, 1995**

Related U.S. Application Data

[63] Continuation of Ser. No. 222,087, Apr. 4, 1994, abandoned.

[30] **Foreign Application Priority Data**

Apr. 16, 1993 [DE] Germany ..... 9305552 U

[51] **Int. Cl.**[6] **B41F 7/06**; B41F 31/08

[52] **U.S. Cl.** **101/177**; 101/183

[58] **Field of Search** 101/366, 363, 101/364, 350, 365, 148, 142, 143, 352, 181, 183, 177, 46; 118/261, 262, 211

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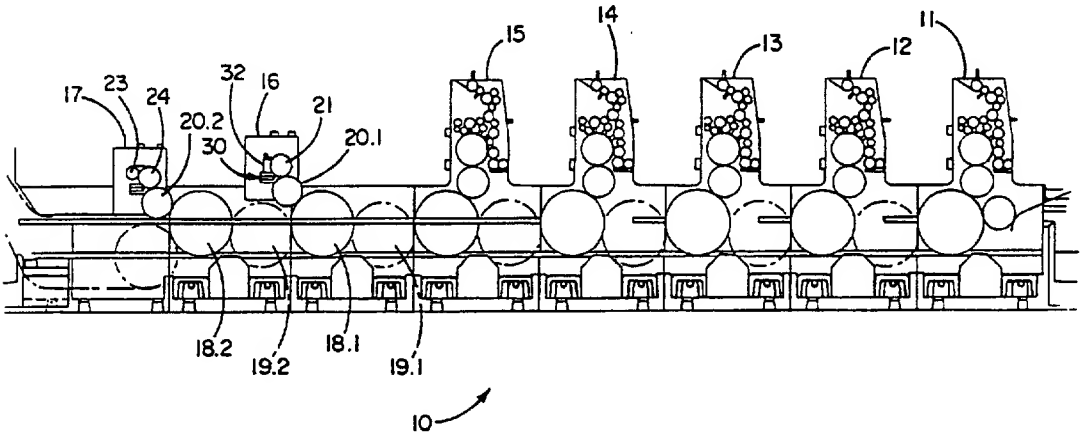
Primary Examiner—J. Reed Fisher
Attorney, Agent, or Firm—Leydig, Voit & Mayer, Ltd.

[57] **ABSTRACT**

A multi-color offset printing press for the printing and in-line coating of materials is disclosed. The printing press includes an in-line flexographic printing/lacquering unit for applying coating fluids to materials printed in the printing press. The flexographic printing/lacquering unit may be installed upstream of the first printing unit, downstream of the last printing unit or in between printing units.

6 Claims, 3 Drawing Sheets



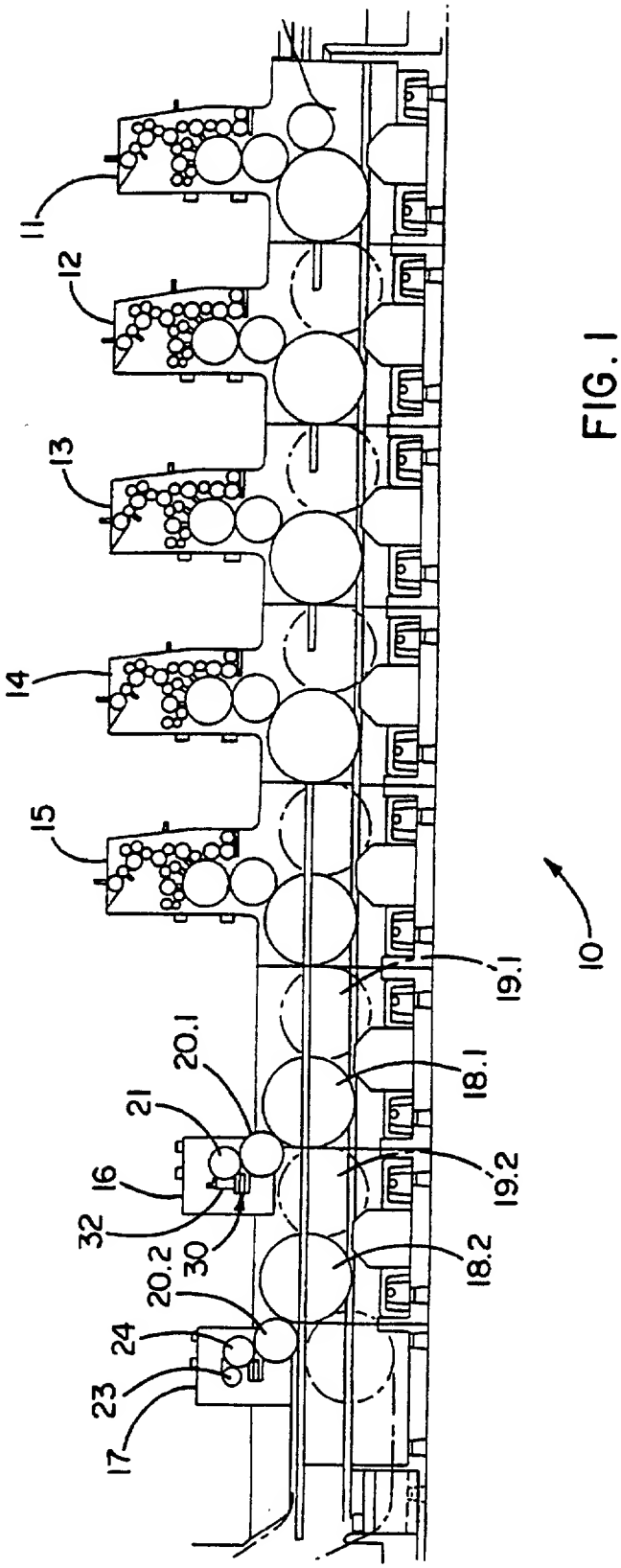


FIG. 1

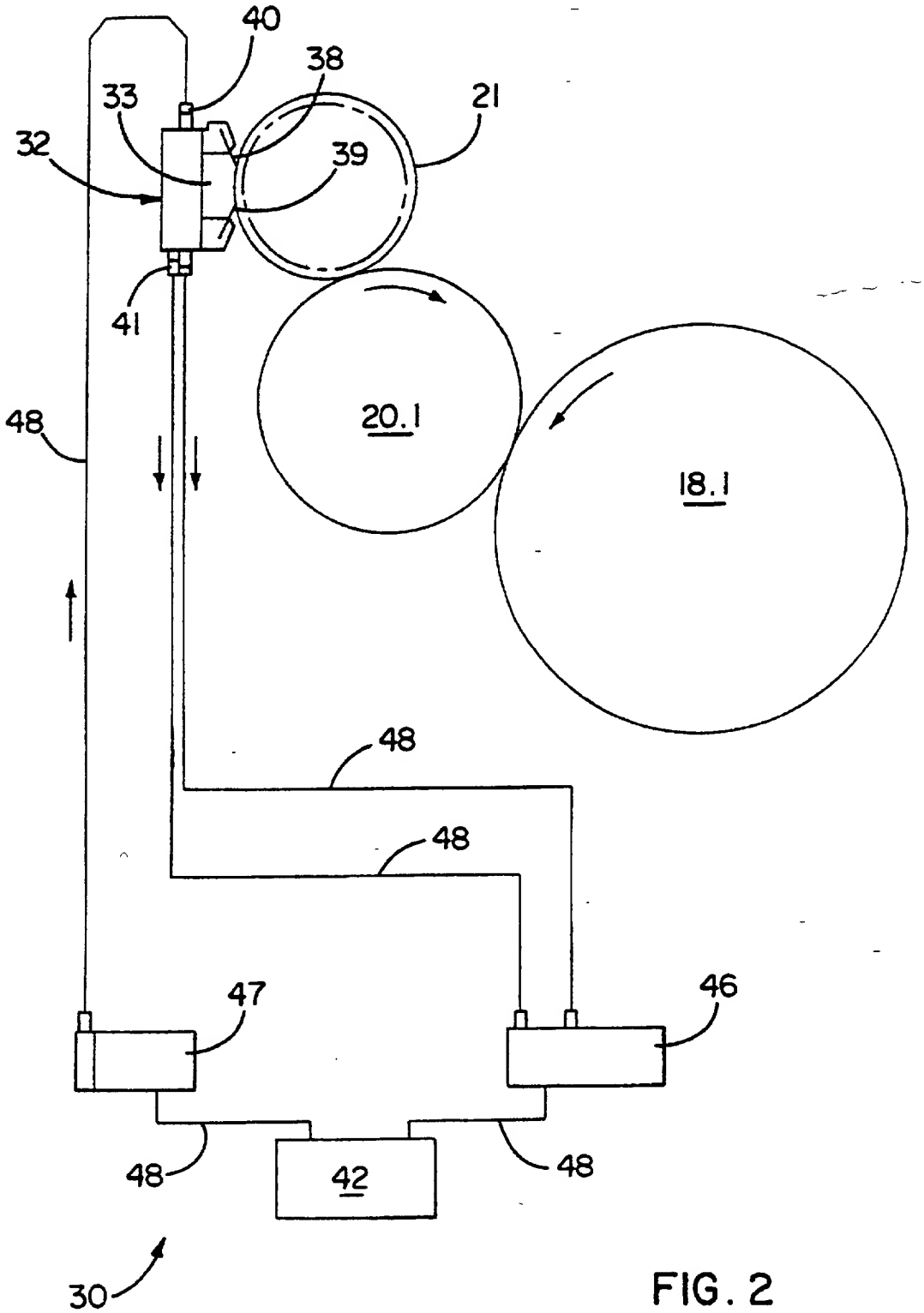


FIG. 2

COMBINED LITHOGRAPHIC/ FLEXOGRAPHIC PRINTING APPARATUS AND PROCESS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates in general to printing machines and processes and in particular to a combined lithographic/flexographic in-line printing apparatus and process.

2. Description of Related Art

As used herein, the following terms have the meanings indicated:

ANILOX ROLLER

A steel or ceramic ink metering roller. Its surface is engraved with tiny, uniform cells that carry and deposit a thin, controlled layer of ink film or coating material onto the plate. In flexo presswork, anilox rollers transfer a controlled ink film from the rubber plate (or rubber-covered roller) to the web to print the image. Anilox rollers are also used in remoistenable glue units and to create "scratch-and-sniff" perfume ads.

ANILOX SYSTEM

The inking method commonly employed on flexographic presses. An elastomer-covered fountain roller supplies a controlled ink film from the ink pan to the engraved metering roller. After ink floods the metering roller, the fountain roller is squeezed or wiped usually with a doctor blade to remove the excess ink. The ink that remains on the metering roller is then transferred to the rubber printing plate.

COATER

A device with a pan to contain the coating material, a pan roller partially immersed in the coating material contained in the pan, and a coater roller to meter off a uniform film of the coating material and apply it to the printing plate.

COATING

An unbroken, clear film applied to a substrate in layers to protect and seal it, or to make it glossy.

FLEXOGRAPHIC INK

A quick-drying, fluid ink that is highly volatile or an ink that can be water based and nonvolatile.

FLEXOGRAPHY

A method of rotary letterpress printing characterized by the use of flexible, rubber, or plastic plates with raised image areas and fluid, rapid-drying inks.

HALFTONES

Dot-pattern images that have the appearance of continuous-tone images because of the limited resolving power of the human eye. This limitation accounts for an optical illusion; small halftone dots, when viewed at the normal reading distance, cannot be resolved as individual dots but blend into a continuous tone.

LITHOGRAPHIC PLATES

A lithographic plate is precoated with a light-sensitive or otherwise imageable coating, and the separation between the image and nonimage areas is maintained chemically. The image areas must be ink receptive and refuse water and the nonimage areas must be water receptive and refuse ink. The wider the difference maintained between the ink receptivity of the image areas and the water receptivity of the nonimage areas, the better the plate will be, the easier it will run on the press, and, consequently, the better the printing. There are several types of lithographic plates. The plate is an image carrier that is said to be planographic, or flat and smooth.

LITHOGRAPHY

A printing process in which the image carrier or plate is chemically treated so that the image areas are receptive to ink.

OFFSET PRINTING

An indirect printing method in which the inked image on a press plate is first transferred to a rubber blanket, that in turn "offsets" the inked impression to a press sheet. In offset lithography, the printing plate has been photochemically treated to produce image areas receptive to ink.

SLURRY

A water suspension of fibers or the suspension of pigment and adhesive used to coat papers. It may also include a suspended metallic material such as uniform-sized metal particles or nonuniform-sized metal particles.

ULTRAVIOLET INKS

Printing inks containing an activator that causes the polymerization of binders and solvents after exposure to a source of ultraviolet radiation.

Offset lithography is a process that is well known in the art and utilizes the planographic method. This means that the image and nonprinting areas are essentially on the same plane of a thin metal plate and the distinction between them is maintained chemically. There are two basic differences between offset lithography and other processes. First, it is based on the principle that grease and water do not mix. Second, the ink is offset from the first plate to a rubber blanket and then from the blanket to a substrate on which printing is to occur such as paper.

When the printing plate is made, the printing image is made grease receptive and water repellant and the nonprinting areas are made water receptive and ink repellant. The plate is mounted on the plate cylinder of the press which, as it rotates, comes in contact successively with rollers wet by a water or dampening solution and rollers wet by ink. The dampening solution wets the nonprinting areas of the plate and prevents the ink from wetting these areas. The ink wets the image areas which are transferred to the intermediate blanket cylinder. The inked image is transferred to the substrate as it passes between the blanket cylinder and the impression cylinder. Transferring the image from the plate to a rubber blanket before transfer to the substrate is called the offset principle.

One major advantage of the offset principle is that the soft rubber surface of the blanket creates a clearer impression on a wide variety of paper surfaces and other substrate materials with both rough and smooth textures with a minimum of press preparation.

Offset lithography has equipment for short, medium and long runs. Both sheetfed and web presses are used. Sheetfed lithography is used for printing advertising, books, catalogs, greeting cards, posters, labels, packaging, folding boxes, decalcomanias, coupons, trading stamps, and art reproductions. Many sheetfed presses can perfect (print both sides of the paper) in one pass through the press. Web offset is used for printing business forms, newspapers, preprinted newspaper inserts, advertising literature, catalogs, long-run books, encyclopedias, and magazines.

In offset lithography, the rubber blanket surface conforms to irregular printing surfaces, resulting in the need for less pressure and preparation. It has improved print quality of text and halftones on rough surfaced papers. Further, the substrate does not contact the printing plate thereby increasing plate life and reducing abrasive wear. Also, the image on the plate is right for reading rather than reverse reading. Finally, less ink is required for equal coverage, drying is speeded, and smudging and setoff are reduced. Setoff is a

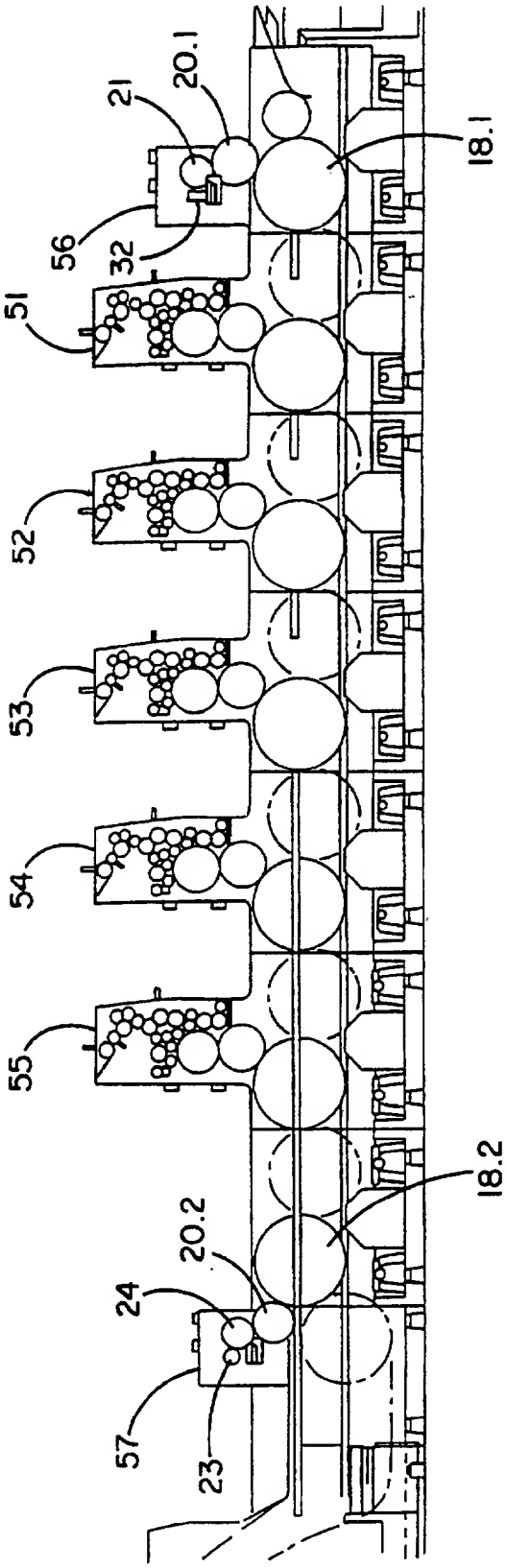


FIG. 3

MULTI-COLOR OFFSET PRINTING PRESS FOR PRINTING AND IN-LINE COATING

This is a continuation of application Ser. No. 08/222,087 filed on Apr. 4, 1994, now abandoned.

FIELD OF THE INVENTION

The present invention relates generally to sheet fed rotary printing machines for polychrome offset printing and more particularly concerns a multi-color offset printing press having an in-line flexographic printing/lacquering unit for the printing and in-line coating of materials.

BACKGROUND OF THE INVENTION

The article "Gold-lacquer printing supersedes metal bronzing," published on pages 42–43 of the February, 1993 edition of the periodical FlexoDruck [FlexoPrinting] describes a printing process wherein a gold-lacquer ink is processed in a multi-color offset printing machine having two so-called lacquer towers. One of the lacquer towers used in this process was converted from a flexographic printing unit and used a flexographic printing plate for coating with a conventional lacquering technique. In comparison with conventional lacquer metering, the article points out that a chamber doctor could be used with the apparatus.

DE 3,906,648 A1 illustrates an applicator unit for use with either high-viscosity, oil-containing layers or low-viscosity, water-soluble layers. The disclosed applicator unit is designed as a lacquering device which can be used either as an offset typographic unit or as an intaglio printing unit. If used as an offset typographic unit, the design starts from a structured scoop roller corresponding to a doctor blade. If used as an intaglio printing unit, the design starts from an applicator roller and a structured form cylinder corresponding to a doctor blade. The typographic printing unit consists of 1) a scoop roller whose surface is engaged by a doctor blade and whose surface profile includes small cups; 2) a transfer roller engaged by smoothing rollers; and 3) a form cylinder equipped with a typographic printing form.

DE 4,122,990 A1 discloses a bronze and fancy-effect printing ink and a process for producing a bronze and fancy-effect print. More specifically, it describes a water-dilutable printing ink having high viscosity and a high pigment fraction. This ink is processed with the lacquer unit of an offset machine or from a flexographic printing unit. A short processing path with few color splits is described as an advantage of this approach.

DE 3.046.257 C2 describes an apparatus having a lacquer-supply container and a scoop roller. In this apparatus, the lacquer picked up by the scoop roller is fed to an applicator roller in a metered manner. Two doctor rollers can be thrown onto the scoop roller and a doctor blade can be thrown onto the metering roller for stripping off lacquer.

DE 3,427,898 C1 discloses an apparatus which meters lacquer by way of a lacquer gap formed between two rollers.

The devices taught by DE 3,046,257 C2, DE 3,906,648 A1, and DE 3.427,898 C1 share at least one disadvantage. When used to process fluids having high viscosities such as fluids with viscosities from approximately 0.1 to 2 Pas, so-called lacquer nests can occur. Specifically, the yield points of these high viscosity fluids can result in faults in the fluid flows which could in turn lead to lacquer nests where lacquer easily dries in an undesirable manner.

DE 3.614,582 A1 discloses a so-called chamber doctor for applying a coating mass onto a coating roller. In this

disclosure, at least two doctor blades bearing on a roller form a chamber for receiving a coating mass. One disadvantage of this structure is that the coating mass, which is fed to the chamber under pressure, can escape only by way of the doctor gap. A further disadvantage is that the excess coating mass is returned via a pressureless space. Finally, when fluids of higher viscosity are used, deposits can build up on the doctor blades and lead to printing faults.

OBJECTS AND SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a multi-color offset printing press for the printing and in-line coating of materials. It is a related object to provide a printing press which performs the in-line processing of quick-evaporating printing inks by applying high viscosity, water-dilutable layers of specific thickness which have fancy effect and/or act as a protective lacquer over the printed materials. It is another related object to provide a printing press which permits the in-line processing of special compositions having either a high pigment fraction or coarse pigments.

It is a further object to provide a multi-color offset printing press which can be combined with additional treating, printing, or coating devices to perform multiple operations in a single, in-line printing machine. It is still another object of the present invention to provide a printing press for the in-line coating of printed materials with coating fluids having viscosities of approximately 0.1 to 2 Pas.

Yet another object of the present invention is to provide a flexographic printing/lacquering unit for supplying coating fluids used in the in-line coating of printed materials to a printing press. Finally, it is a related object to provide a flexographic printing/lacquering unit which limits the evaporation of quick evaporating fluids used in a multi-color printing press which performs the in-line printing and coating of materials.

The present invention achieves these objectives by providing a multi-color offset printing press comprising at least one offset printing unit and at least one lacquering unit designed as a flexographic printing unit to enable the in-line coating of materials printed by the printing unit(s) even when high-viscosity fluids are employed. The flexographic printing/lacquering unit can use lacquers or pigmented inks on a water base (metallic-luster prints) for in-line coating. In addition, the flexographic printing/lacquering unit can be used within the inventive printing press to perform either reserve lacquering (spot lacquering) or full-surface lacquering.

Pursuant to the invention, the offset printing press comprises a first offset printing unit for printing the materials; a flexographic lacquering unit for selectively coating the printed materials with coating fluids; and, a second lacquering unit disposed downstream from the flexographic lacquering unit with respect to the direction of movement of the materials through the press.

In accordance with a more specific aspect of the invention, the flexographic printing/lacquering unit for the in-line application of coating fluids to materials printed in an offset printing press includes: an impression cylinder for carrying the printed materials; a form cylinder carrying a typographic printing plate for applying the coating fluids to the printed materials carried by the impression cylinder; an applicator roller disposed in contact with the form cylinder for transferring the coating fluids to the typographic printing plate; and, a closed fluid-transport system having a reservoir

containing the coating fluids, a chamber doctor disposed adjacent the applicator roller for supplying the coating fluids thereto, and a pump for circulating the coating fluids between the reservoir and the chamber doctor.

The closed fluid-transport system of the flexographic printing/lacquering unit reduces the evaporation of the coating fluids used in the printing press thereby improving the processing of quick-evaporating fluids such as water-soluble fluids. In addition, the chamber doctor of the closed fluid-transport system prevents the splashing of lacquer or ink which could occur if either open doctor-blades or a scoop roller were used. Likewise, the possible build-up of dried-on lacquer/ink residues on the doctor-blade edge is prevented by the flow of fluids through the close fluid-transport system and the chamber doctor. The inventive flexographic printing/lacquering unit, including the closed fluid-transport system and the chamber doctor, constitutes a functional module which can be used in various settings and combinations.

The inventive combination of at least one offset printing unit and at least one flexographic printing unit discussed above, can be modified in various ways without departing from the invention. For example, a conventional lacquering apparatus can be positioned downstream of the offset printing unit(s) and the flexographic printing unit(s) to perform further in-line processing of the printed materials such as full-surface lacquering.

These and other features and advantages of the invention will be more readily apparent upon reading the following description of a preferred exemplified embodiments of the invention and upon reference to the accompanying drawings wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a multi-color offset printing press constructed in accordance with the teachings of the present invention to perform the printing and in-line coating of materials;

FIG. 2 shows a diagrammatic representation of a flexographic printing/lacquering unit constructed in accordance with the teachings of the present invention; and,

FIG. 3 shows an alternative embodiment of the inventive multi-color offset printing press.

While the invention will be described and disclosed in connection with certain preferred embodiments and procedures, it is not intended to limit the invention to those specific embodiments. Rather it is intended to cover all such alternative embodiments and modifications as fall within the spirit and scope of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 illustrates a multi-color offset printing press **10** constructed in accordance with the teachings of the present invention. The printing press **10** (shown here without a feeder and delivery) includes five printing units **11–15**, a coating or lacquering device **16** comprising a flexographic printing unit disposed downstream of the printing units (in the sheet-running direction), and a second lacquering unit **17** disposed downstream of the flexographic coating device **16**. The second lacquering unit **17** can be a conventional unit or another flexographic printing/lacquering unit. However, in the instant embodiment, the second lacquering unit **17** is of the conventional type. The flexographic printing/lacquering unit **16** can be used as a spot-lacquering apparatus (for reserve lacquering) and the second lacquering unit **17** can be used for full-surface refinishing. However, it will be appreciated by those skilled in the art that the flexographic printing/lacquering unit **16** can also be used for full-surface lacquering.

Both the flexographic lacquering device **16** and the second lacquering unit **17** include an impression cylinder **18.1**, **18.2**, a transfer drum **19.1**, **19.2** and a form cylinder **20.1**, **20.2**.

The form cylinder **20.1** of the flexographic lacquering unit **16** carries a clamped, flexible typographic printing plate such as a flexographic printing plate. As best seen in FIG. **2**, an applicator roller **21** having a structured surface including small cups disposed in a grid pattern (i.e., a grid roller) is positioned in contact with the form cylinder **20.1**. This applicator roller **21** acts as a lacquer roller.

In order to supply the applicator roller **21** with fluids, the flexographic lacquering unit **16** is further provided with a closed fluid-transport system **30**. This closed fluid-transport system includes a reservoir **42**, a suction pump **46**, a chamber doctor **32**, and a feed pump **47**. These components of the closed fluid-transport system communicate through conduits **48** as set forth below.

The reservoir **42** is a holding vessel or container for holding the coating fluids for use in the in-line coating process. In order to transfer these coating fluids to the other components of the fluid-transport system, the reservoir **42** is provided with an inflow and an out-flow. The out-flow of the reservoir **42** communicates with a conduit **48** which, in turn, communicates with the feed pump **47**. Feed pump **47** generates a suctioning force which draws the coating fluids through conduit **48** and transports them to the chamber doctor **32**.

The chamber doctor **32** is disposed adjacent the applicator roller **21** so as to be capable of being selectively thrown onto the latter. The chamber doctor **32** includes a positive doctor blade **38**, a negative doctor blade **39**, and closing-off sides which combine to form a chamber **33** having an opening disposed adjacent to and facing the applicator roller **21**. The positive doctor blade **38** is positioned so that it points in the direction of rotation of the applicator roller **21** and acts as a closing doctor blade. The negative doctor blade **39**, on the other hand, is positioned so that it points opposite or counter to the direction of rotation of the applicator roller **21** and acts as a working doctor blade.

The housing of the chamber doctor **32** includes a fluid inflow **40** located at the top of the chamber doctor **32** for receiving the coating fluids supplied by the feed pump **47** through conduit **48** and two fluid out flow drains or run-offs **41** located at the bottom of the chamber doctor **32** for carrying the coating fluids out of the chamber **33** of the chamber doctor **32**. To promote appropriate fluid flow, the fluid inflow **40** is positioned near the center of the top panel of the chamber doctor **32** and the two issuing fluid run-offs **41** are arranged near the side parts of the lower portion of the chamber doctor **32**.

It will be appreciated that the use of two run-off drains **41** necessitates the use of two conduits **48** for carrying the coating fluids exiting the chamber doctor **32**. These two conduits **48** communicate with the suctioning pump **46**. Thus, the suctioning pump draws the coating fluids out of the chamber doctor **32** via the out-flow drains or run-offs **41**, and returns them to the reservoir **42** via the reservoir's inflow. Thus, the reservoir **42**, the feed pump **47**, the chamber doctor **32**, the suctioning pump **46**, and the conduit **48** combine to form a closed fluid-transport system which circulates coating fluids. It will be appreciated by those

skilled in the art that the closed nature of this system reduces the evaporation of the coating fluids. It will further be appreciated that the feed pump **47** and the suctioning pump **46** are required so that fluids such as gold and silver printing ink, zinc white or lacquer, having high viscosity as a result of their pigmentation can be processed.

In use, the reservoir **42** would first be provided with a quantity of an appropriate coating fluid. A high viscosity, water base coating fluid such as gold and silver printing ink, zinc white, or lacquer, are possible choices. This coating fluid is then conveyed from the reservoir **42** through conduit **48** into the chamber **33** of the chamber doctor **32** by the feed pump **47**. The feed pressure generated by the feed pump **47** creates an overpressure inside the chamber doctor **32**. As a result, some of the high viscosity coating fluid is forced from the interior of the chamber doctor **32** (i.e., chamber **33**) onto the applicator roller **21** while the remaining coating fluid is forced through the fluid run-offs **41**. The coating fluid which is forced through the run-offs **41** is conveyed back into the reservoir **42** by the suction pump **46**.

The coating fluid which passes to the applicator roller **21**, however, fills the small cups disposed in a grid pattern on the surface of the applicator roller. The rotating applicator roller **21** acts as a lacquer roller and carries the coating fluid away from the chamber doctor **32**. As the applicator roller **21** rotates past the chamber doctor **32**, the negative doctor blade **39** scrapes the excess coating fluid from the webs formed between the small grid-pattern cups on the surface of the applicator roller **21** thereby insuring that the coating fluid remains solely in the small grid-pattern cups. As explained above, the applicator roller **21** is in contact with the form cylinder **20.1**. As a result, the coating fluids carried by the applicator roller **21** are transferred to the typographic printing form or plate stretched on the form cylinder **20.1**. The typographic printing form then applies the coating fluids as a layer to the printed materials fed by the impression cylinder **18.1**.

Unlike the flexographic printing/coating unit **16** described above, the second lacquering unit **17** includes a pair of rollers for forming a metering gap. More specifically, a metering roller **23** is thrown onto an applicator roller **24**. A mass of coating fluids is introduced directly into the gap between these two rollers **23, 24**, and is fed by way of the applicator roller **24** to the form cylinder **20.2**. The form cylinder **20.2** then applies the coating fluids to the printed materials carried by the impression cylinder **18.2**.

By staggering the offset printing, flexographic printing, and lacquering processes in the manner taught by the instant invention, an especially good work result can be achieved. This technique is particularly useful for metallic-luster coatings. In addition, rapid processing of either the readily evaporating metallic printing ink or the printing lacquer in combination with the subsequent lacquer coating advantageously increases the luster of the printed materials.

An alternative embodiment of the multi-color offset printing press **50** is illustrated in FIG. **3**. In this embodiment, the flexographic printing/lacquering unit **56** is positioned upstream of the first printing unit **51**. This particular configuration permits the application of basic coatings prior to printing. For example, zinc-white coatings can be applied to a sheet-metal material, plastic foil or cardboard before printing. In addition, in this embodiment, the final lacquering is performed by a second lacquering unit **57** disposed downstream of the last printing unit **55**. Alternatively, an integrated lacquering unit disposed on a conventional printing unit can be employed for final lacquering.

Although particular embodiments of the invention have been disclosed, it will be appreciated that this disclosure is by no means meant to limit the scope of invention to these embodiments. For example, it will be appreciated that flexographic printing/lacquering units **16** as disclosed in the first embodiment **10** of the invention could be positioned between two or more of the printing units **11–15** of the printing press for applying intermediate coatings without departing from the invention. Such intermediate coatings might be useful for performing a drying function.

We claim as our invention:

1. An offset printing press for the printing and in-line coating of materials, the offset printing press comprising, in combination:

a first offset printing unit for printing materials;

a flexographic lacquering unit for partially coating the materials with a first layer of coating fluids having viscosities of between approximately 0.1 and 2.0 Pas inclusive, the flexographic lacquering unit having:

(1) an impression cylinder for carrying the materials,

(2) a form cylinder carrying a typographic printing plate and contacting the materials carried by the impression cylinder for transferring the first layer of coating fluids thereto,

(3) an applicator roller engaging the typographic printing plate on the form cylinder for transferring the coating fluids thereto,

(4) a chamber doctor engaging the applicator roller for applying the coating fluids thereto, the chamber doctor comprising

(a) a positive doctor blade disposed for contacting the applicator roller in its direction of rotation,

(b) a negative doctor blade disposed for contacting the applicator roller counter to its direction of rotation, and

(c) side portions combining with the negative and positive doctor blades to form a chamber having an opening adjacent to and facing the applicator roller, and

(5) a closed fluid transport system comprising

(a) a reservoir containing the coating fluids,

(b) a feed pump for pumping coating fluids from the reservoir to the chamber doctor, and

(c) a suction pump for pumping the coating fluids from the chamber doctor back to the reservoir; and,

a second lacquering unit for fully coating the materials with a second layer of coating fluids, the second lacquering unit being disposed downstream from the flexographic lacquering unit with respect to the direction of movement of the materials through the press.

2. An offset printing press as defined in claim **1** wherein the flexographic lacquering unit is disposed upstream from the first printing unit with respect to the movement of the materials through the press such that the flexographic lacquering unit applies the first layer of coating fluids to the materials before they are printed.

3. An offset printing press as defined in claim **1** wherein the flexographic lacquering unit is disposed downstream from the first printing unit with respect to the movement of the materials through the press such that the flexographic lacquering unit applies the first layer of coating fluids to the materials after they are printed.

4. An offset printing press as defined in claim **1** further comprising a second printing unit wherein the flexographic lacquering unit is disposed between the first and second printing units for applying the first layer of coating fluids to

the materials after they are printed by the first printing unit but before they are printed by the second printing unit.

5. An offset printing press as defined in claim 1 wherein the applicator roller has a surface including cups disposed in a grid pattern for receiving the coating fluids.

6. An offset printing press as defined in claim 1 wherein the second lacquering unit further comprises an impression cylinder for carrying the materials, a form cylinder contacting the materials carried by the impression cylinder for transferring the second layer of coating fluids thereto, an applicator roller engaging the form cylinder for transferring the coating fluids thereto, and a metering roller operatively engaging the applicator roller to form a metering gap therebetween for controlling the flow of the coating fluids.

* * * * *

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Reissue Application of:	§	
BILL L. DAVIS and JESSE S. WILLIAMSON	§	
	§	
For Reissue of U. S. Patent 5,630,363	§	Group Art Unit: 2854
Issued May 20, 1997	§	
Serial No. 08/515,097	§	
	§	
Filing Date: May 20, 1999	§	Examiner: S. Funk
	§	J. Hilten
	§	
Serial No.: 09/315,796	§	
	§	
For: **COMBINED LITHOGRAPHIC/**	§	
FLEXOGRAPHIC PRINTING	§	
APPARATUS AND PROCESS	§	

DECLARATION OF GARY DOUGHTY

I, Gary Doughty, being duly sworn, declare and state the following:

1. During May of 1992, I was President of Classic Color, Incorporated, a subsidiary of Williamson Printing Corporation. I am a co-inventor of the "WIMS" process, now embodied in U.S. Patent No. 5,370,976.

2. Immediately after filing the application leading to the '976 on May 22, 1992, Jesse Williamson and I embarked on a trip to Germany for several reasons, one of which was to try to encourage MAN-Roland to utilize the WIMS process. A copy of my itinerary and a recap is attached hereto as Group Exhibit A. Prior to visiting MAN-Roland on the afternoon of May 27, 1992, we visited several "Hi-Fi"/color separation facilities, including Reufforth G.m.b.H. (Mühleim), Eder Repros Offset Repro G.m.b.H. (Stuttgart) and Wittemann and Küppers Reprowerk Stätten G.m.b.H. (Frankfurt). Jesse Williamson had long discussions in the car with me and Harry Bowyer of Wolstenholme International Ltd. (U.K.) as to how we could increase the amount of metallic ink to be delivered to the substrate.

3. On the afternoon of Wednesday, May 27, 1992, we visited the MAN-Roland facilities in Offenbach, Germany. I recorded part of our conversations with the Germans (see Exhibit B transcription). My trip report is attached hereto as Exhibit C.

4. During the visit to MAN-Roland's facilities, Jesse Williamson mentioned to me the desirability of going "up front" in the offset lithographic process with a flexographic

unit having an anilox roller or using a gravure printing unit up front. We also discussed this approach with Harry Bowyer in the car after the visit.

5. On June 3, 1993, I returned to Dallas. Jesse returned to Dallas on May 31, 1992.

The undersigned Declarant stated further that all statements made herein of Declarant's own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Gary Doughty

Date: 9-24-00

EXHIBIT A

TO: JESSE WILLIAMSON

FROM: GARY DOUGHTY

SUBJECT: EUROPEAN TRIP

DATE: MAY 18, 1992

ITENERARY FOR EUROPEAN TRIP AS OF MAY 5-18-92

FRIDAY, MAY 22	DEPART DFW VIA AMERICAN AIRLINES #70	2:55PM
SAT., MAY 23	ARRIVE FRANKFURT, GERMANY Hotel in Offenbach Take Taxi from Airport (10-15 MINS)	7:40AM
SUNDAY, MAY 24	ADJUSTMENT DAY	
MONDAY, MAY 25	MEET WITH HARRY BOWYER (WOLSTENHOLME)	??
TUESDAY, MAY 26	VISIT W/HANS REUFFUTH (REUFFUTH) English Suspect MAN/ROLAND to INTERPRET VISIT W/HARALD KUEPPER English Good (WITTEMANN & KUEPPERS)	10:00AM 1:00PM
WED., MAY 27	Drive ~~FLY~~ TO STUTTGART (Approx 2 HRS) English Good VISIT W/HERR INNO EDER (EDER REPROS) Drive ~~FLY~~ BACK TO FRANKFURT (Approx 2 hrs) AT MANROLAND — VISIT W/HERR HELMUTH PLEIER (MANROLAND)	~~??~~ Leave 8:00 AM 10:00AM Leave 12:00 3:00PM
THURS., MAY 28	FLY TO LONDON, HEATHROW VISIT W/TONY JOHNSON & CHRIS BAKER (CROSFIELD/LONDON) 45 MIN Drive TRAVEL BY CAR TO DARWEN, LANCASHIRE DINNER W/ HARRY BOWYER 2 HRS	ARRIVE 10:00AM 11:00AM ?? AFTER? CONTEX
FRIDAY, MAY 29	MEET W/PERSONNEL FROM WOLSTENHOLME Wolstenholme driver — * VISIT W/CONTEX & CROSFIELD SHOP AM to F/U & Deliver SPEND EVENING IN MANCHESTER Lunch in boardroom @ Wol. Meet w/Wol Personnel	?? ??
SAT., MAY 30	TRAIN FROM MANCHESTER TO LONDON 200 MILES ~~AM~~ 9:45 - 12:00 SPEND EVENING IN LONDON	
SUNDAY, MAY 31	DEPART LONDON-GATWICK VIA TRAIN FROM LONDON TO VICTORIA STATION TO GATWICK (Approx 45MIN) MUST ARRIVE @ Airport by 9:00 AMERICAN AIRLINES #51 ARRIVE DFW AIRPORT	10:40AM 2:45PM

DAWN NICHOLSON OF WOLSTENHOLME (HARRY BOWYER'S SECRETARY) WILL/HAS BOOKED ALL INTERMEDIATE TRAVEL (AIR, RAIL, CAR) AND HOTEL ACCOMODATIONS. ANY QUESTIONS OR PROBLEMS, PLEASE LET ME KNOW.

RESPECTFULLY SUBMITTED,

GARY DOUGHTY

* WAITING FOR CALL FRM GREG SMITH FROM XYVISION/CONTEX TO CONFIRM EXACT TIME/NAME OF COMPANY AND PARTIES INVOLVED FOR THIS VISIT.

CC: JERRY WILLIAMSON
SHERM SWEENEY
DAWN NICHOLSON

MAN/ROLAND (POLYMENT)

Itinerary Recap

Fri. May 22 Departed DFW to Germany

Sat May 23 Arrived 8:30 AM in Frankfurt Germany

Sun May 24 Preparation day. No meetings scheduled

Mon May 25 Harry Bowyer of Wolstenholme arrived in Frankfurt. Discussed proposed itenerary and coordinated how we would present our story to those we came to see.

Tues May 26 Met with Hans Reufforth. Due to communication mixup missed meeting with Harald Küppers (Witteman/Küppers Repro). Dinner with Harry Bowyer and Helmuth Pleier (Man/Roland)

Wed May 27 Met with Inno Eder (Eder Repros) in Stuttgart. Met with Helmuth Pleier (Man/Roland) and toured Man/Roland sheetfed facility in Offenbach.

Thurs May 28 Met with Harry Bowyer, Paul Rink, et al (Wolstenholme) in Manchester, England.

Fri. May 29 Met with Tony Johnson (Crosfield Electronics) in Hemel Hempstead, England

Sat. May 30 No meetings planned. Toured London.

Sun May 31 Jesse Williamson returned to Dallas. Harry Bowyer left for China. Gary Doughty returned to Frankfurt, Germany for rescheduled visit to Witteman/Küppers Repro

Mon June 1 Met with Harald Küppers (Witteman/Küppers Repro) in Frankfurt, Germany.

Tues. June 2 Met with Neil Gleghorn (The Box Place Ltd) in ~~Staffordshire~~, England. Attended Pakex '92 in ~~Leeds~~ Birmingham, England ~~Returned~~ Returned to London

Wed June 3 Returned to Dallas

Sun June 7 Attended Contex Annual Users Group Meeting (w/Bob Emrick) in Boston, Massachusetts.

ITINERARY RECAP

Friday, May 22	Departed DFW to Germany.
Saturday, May 23	Arrived 8:30 a.m. in Frankfurt Germany.
Sunday, May 24	Preparation day. No meetings scheduled.
Monday, May 25	Harry Bowyer of Wolstenholme arrived in Frankfurt. Discussed proposed itinerary and coordinated how we would present our story to those we came to see.
Tuesday, May 26	Met with Hans Reuffurth. Due to communication mixup missed meeting with Harald Kuppers (Witteman/Kuppers Repro.) Dinner with Harry Bowyer and Helmuth Pleier (Man/Roland.)
Wednesday, May 27	Met with Inno Eder (Eder Repros) in Stuttgart. Met with Helmuth Pleier (Man/Roland) and toured Man/Roland sheetfed facility in Offenbach.
Thursday, May 28	Met with Harry Bowyer, Paul Rink, et al (Wolstenholme) in Manchester, England.
Friday, May 29	Met with Tony Johnson (Crosfield Electronics) in Hemel Hempstead, England.
Saturday, May 30	No meetings planned. Toured London.
Sunday, May 31	Jesse Williamson returned to Dallas. Harry Bowyer left for China. Gary Doughty returned to Frankfurt, Germany for rescheduled visit to Witteman/Kuppers Repro.
Monday, June 1	Met with Harald Kuppers (Witteman/Kuppers Repro) in Frankfurt, Germany.
Tuesday, June 2	Met with Neil Gelghorn (The Box Place Ltd.) in Staffordshire, England.
Wednesday, June 3	Returned to Dallas.
Sunday, June 7	Attended Contex' Annual User's Group Meeting (with Bob Emrick) in Boston, Massachusetts.

Crosfield (GARY/JESSE)
Steve Ripley Sys. Integration ~~Spe~~ Consultan
Tony Walker Director Export Sales
Tony Johnson Head of Colour Technology Researe

Reuffurth (Gary Jesse)
Hans Reuffurth

Kieppers (Gary Only)
Harald Kieppers

Eder (Gary/Jesse)
Inno Eder

Ray Prince GATF (Gary)
(Contacted Tony Johnson on our behalf)

Man Roland (Gary/Jesse)
Helmuth Pleier Dept Head / Print Demonstration
Wolfgang Sweiber Head of Printing Service
~~Bob~~

Wolstenholme (Gary Jesse)
Helen Middleton Mktg Services Assistant
Ron McDonald Technical Mgr / Inks Division
Harry Bowyer Mkt. Development Mgr
Paul Rink Head Dude
Dawn Nicholson Life Support

Plat Super?
Jeff (?)

Contex (Gary Only)
Paul Beech Sales Executive
Neil Gleghorn Mangging Director "The Box Room"

Pakex (Gary Only)
Nigel J. Cliffe Sales Director Catalyst Repro Technology

EXHIBIT B

more printers must be trained so the graphics industry grow bigger and bigger. Today it's a must to demonstrate the machine, in the past we .. the machines to day we have to sell machines. About 16 - 17 years ago a copy center was built outside here in the ? area. It was a small hall with 3-4 machines. What you see today was enlarged before .. we now have 17 machines. Printing service is divided in two parts, demonstration and education that's my business, and sending away demonstrators. But we all live together in on house and the printer are more less the same they get .. for training for demonstration or they can be sent away. Right now guys from ? told me because.. These guys are everywhere around the world. So as I told you before ?.. to make it good looking .. beautiful color comes out. Where a lot of people .. and you have.. CCI without .. to make them familiar with the handling of the CCI and here we train them working with our center control desk. If he.. here we train them, job finding, job separation, that's the so called ... Technical Print Separation so everything what we can have .. must be prepared in some way and where we have only very short.. more runs the printer has no time to do just separations. A man can do that before, load.. choosing his job by means of a cursor. By means of his cursor looking for his job and bring it to your particular press. So what's behind I got to show you on the machine it's easier for me because the separation can be done here but I also .. on the press. Only for training purpose because it's.. and we have it on the machine to make people give them a safe feeling.

Lots of background noise. Other person. Talking about calibrating. Talking about presses and change overs doesn't take more than one minute. That's the reason we have had a lot of success with this press. Because it's one over one it must by Unix. The device is in the middle the machine has very good access so in the comparison with a Miller machines in the past it was our let's say a very competitive machine. Now we also own Miller. We offer same technique twice more less. Because the turning device is more or less the same. It must be same process. The printing is usual the printing zone transfers to collecting zone .. mode the sheet is transferred to the next unit it turns around till it comes .. to the detecting device that's all. It's Miller.... except Heidelberg they have a one arm.. but the principal is the same. .. to assure precise alignment. Miller is the same process. **Jesse.** We've never switched it. **Other person.** That's always a question I am always asked because a lot of machines from our Unix presses Miller, Heidelberg were sold with a perfecting device and it was standard equipment more less. And if I ask printers how often do you use it - look at this - the .. is here what .. a ... presses it was a special .. device. In our country. **Jesse.** Well in Miller you have to say I want, it.. **Other person.** On a Miller no problem. ? is much more easier to install a ? device ... difference. **Extreme background noise. Other person.** That's RBI console, that's our ? machine, that is the RBI control the remote control for this machine. This RBI is an optional for a one over one machine. It must not .. they have the same layout more less.. **Jesse.** We make many two over two's? **Other person.** For two over

two we have ? machines because the two ... for one over one is one part. We have machines that are regular size, four color plates for two over two. **Gary.** That's what we have. **Jesse.** What does record mean. **Other person.** Record is a five ... configuration. I show you what I mean. It's a record theory..

Other person. Unix presses .. the part when a printer made a decision for a five Miller press... ? they also have five Miller machines and if they bought a Unix press it could be Miller, a Cuerbower, a Kamorie, a Mitsibusi, a Heidelberg now we also compete in this market. Akamie has a five Miller press that looks like a Unix press. **Jesse.** I haven't seen them print well. **Other person.** I'm not happy with this composition because a had some... there was some success in the Far East .. States. But as far as I know they don't last as long as ours. Ours has been for 4 years. **Jesse.** There is one is Dallas that's two years, we bought a company out .. that's two years old it didn't print worth a shit. **Other person.** Ok let's do that. I don't justify the ? because a man who bought a machine like that must be convinced. Here we have in the middle a double size. **Jesse.** Prints like a Kamori? I would say more like a Lanita. More like Lanita. They have problems with... The principal is still the same. All our .. work like the Miller they were the reinventors of this. Talking about main controls. So what do we have to change, a mechanical change. They have to make by hand. But what do we have to change over for a table like this... Talking about plates on an 800. That's a 90,000 not 800. 44,000 is only half as much but 90,000 is a lot. 90,000 on the 800. This one is running up to 40,000. **Jesse.** Can you change the grippers. **Other person.** No, you can change we say you shouldn't change if it exceeds 20. I show you. Setting that must be changed here is ?, and the dial out here. Only once a ? and a dial that's all. Then nothing more must be done. All other settings is necessary and is the ? of the front plate .. can be done from outside. ? all front plates without a tool can do it from here. The ? of the alignment.. can be done from outside.... Individual settings from outside. Also a caulking and image caulking can be done by means of our transverter. So do a job the first color to the second caulking can be done, not plate caulking we use the transverter for image caulking. This is sheet caulking, ok, for the alignment and in between we also can make a caulking by means of this element. This is a transverter where you normally... Talking about transverter can not make out clearly. They were inventors of the principal, but we did something special with our so called ten o'clock position we make sure the sheet is fully printed half is delivered... for accuracy... Also the ink control. is main console, the changing of the ovulation timing is main console. In separation it means that you stop the press and you want to keep the profile of the rotors of the inkers stable to have a separate in the ink drain?. ? is on the main console program. Standing distance is integrated but with controller or without controller make console program.... Everything kept in control and programmed from the main console. That's the idea. To keep everything... An even an automatic washer device for the rollers is standard. But you can also do on the run you can change this

E20

... to form roller to minimize... What you don't do but lot of German ... must do is they change the plate ... half or down, you always have bearer. This press can run a bearer or not. Especially in the packaging field a lot of printers prefer for half to run original length. They change, we change with changing ? of the plates. If they increase the packing that would mean more grease of the set of the ink ... What we do we go away from there .... without changing the dressing of the... because we can run with or without bearer contact. To avoid to much pressure of the .. rollers we have a caulking setting for all inkers, up and down. Where it must be done at all. In here behind the .. key where it can come during the run on the run .. or we use this stroke. **Jesse.** So do you do it by automatic. **Other person.** No, not automatic, this is a manual board. And that's not on the main front of it down from here. ... strokes all of this is timing. Calculation timing on the main console. **Jesse.** If I want to take form roller that hit's here and I want to move it to here. **Other person.** Yes, that is timing through you change the profile from .. that's done on the main console. What I meant it was the ... calculation of the form rollers. Also the form rollers can have a certain oscillation to reduce ghosting. **Jesse.** You can speed it up or slow it down. **Other person.** No, that is only a side way motion.... stroke... that was motion of the ink form rollers. So you started our ... **Jesse.** We made our own rollers do this. **Other person.** It washes out sometimes and the part we have a special roller it was so called ? form roller. It was good for frame work like this. But with this type of roller with it's accurate motion we can have better results regarding ghosting.... Everything we sell that means all this information from the machine is either .. here we have the electronic component and here the key components, everything is controlled on the run and what do you see here? That's all. For the full control of the machine as a process it .. the eye or sees the eye whatever you ask. All the whole dialogue is a ? .... Let's see what we have in here I bet we have a production time, for the job we have in production and a job separation time will come out again, but we can go through different jobs which are processed or which can be repeated. That's our job separation. So a .. can do now a job separation of putting job ...process can be timed we also can copy an existing job giving a new customer name. I don't want to show you now I only want to explain. **Jesse.** So you can copy this one and wipe it off and then and then have a copy change. **Other person.** You can keep it but give it new name because this job be that for instance was a laser job. As a paper, what do you say label paper, and the whole setting up the machine same size, same ? setting can be used. Except the customer name. Why to make it either richer setting of everything. **Jesse.** Can you do that. **Other person.** I don't know how to handle it in detail but I have to say the daily use it works. **Jesse.** You told me you knew everything. **Other person.** Not everything, not everything. I try. **Jesse.** On this press if I picked this and I punched this in does this set the feed board and everything. **Other person.** Right. So when I go through you will see more details. The machine was set for 6000 speed, minimum speed was 3500, washer speed was 6000. Now nothing, we can have

one more look and see ink water balance. You see 1, 2, 3, 4, 5 units were on this one was off. That is the ? cycle that means fountain roller takes away ink every third revolution. We can change every 6 every 9, it's a program factor for low amount of ink arrangements. We ... have some values for these.. ink roller, here we are. The values for the oscillation timing. Whenever we go through with our cursor here we can change all the particular units we can increase and decrease water, or ink. All ink .. are closed now this one is opened about 70%. So everything can make control here or we can make control from this console. If two men work together, one man for instance can make register, with the original menu now. So with the cursor plus and minuses we can do on run ... I can say plus and minus like this and go down see the change take place now like this. The other can use this one but it's not right way normally you define it from here. But only on the run. **Jesse.** Does that move the plate cylinder? **Other person.** Yes. So every individual unit or you can make what we call mix. If one man is working with ink here this unit would be opened, I told you. This one number five, is here, I would to look for the ink unit number five. I've got one open, no they are closed now. You can all see the ... here and you go through no information everything is on zero. They are all on zero. They are closed. But one man can operate here can open five like this, you will see now, and the other man can make corrections with the cursor here. They can work in combinations. There is no need to use this push button you gonna do everything over here as well. But whatever you do it's illustrated shown on this console here. Only to visualize what you have done to justify the sheet. But I want to show you the dialogue of the machine. Not running around the press, everything is show here. I close them up again. This profile can be stored on a .. or it's stored with a job. I think you must know again that although that you would be ... here. ... about the duration of this one... gives me temperature control, gives me the percentage of alcohol .... 2% difference. The control takes by .. control of the additives, it's so different because most of the American guys work without alcohol. It's more relative to the alcohol. It also gives that information of the conductivity, must be somewhere... You can control the agents related to the system you use you can integrate... We have a system that work at about 2% of an additive. Normally .... **Jesse.** When you wash the blanket what blanket washers? **Other person.** Blanket washers are here. **Jesse.** Do you spray the blanket with water. **Other person.** It is sprayed with water and ?. Normally is a little bit water is a cloth that is pressed against the blanket before it stands up. **Jesse.** Where does it take it to?

Other person. Lots of background noise. We like it very much because it don't use that much of the tank. We take a rag we put the rag in take it around the whole machine ... **Jesse.** What about the plates, do you wash the plate at all? **Other person.** No, no.

Other person. You find sheet size and then ... move to right position.. automatically the ... setting for the .... which units are on is indicated or not and that what the system uses, but we

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.... They will change to the required position. Jesse. If I want to go to the heavier stock you know.... **Other person.** I recommend the change gripper from the transverter if it exceeds 20,000. No changing of the .. must be done only here.. because of the timing. Can not understand lots of noise.

Crosfield

Other person. The pastel correction ... can be modified to either biased or dirty colors or towards true pastel colors, clean pastels. And if you shut down the gray balance windows so you can get into the ..... neutralization on these colors which is sightly off neutral. And then use the pastel correction to boost those dirty colors. That gives you the best chance of actually bring them up. The danger of doing that was bring down the pastel boost ... to bring down the gray balance window. Is that you might start to make these browns go a little bit bluish. The pastel boost on the other hand should help to bring them back. I say I've never tried to do it. It's the way I would naturally look to get around that process. **Gary.** Now one of this things that's happened to us when we used when we were working with the gray balance window is that then we had a, we could recover some of this and then we would get very harsh when we went into an actual neutral area. We get a very harsh break and get some contouring around that. But I don't know that's simultaneously we did something with pastel boost but frankly I'm not sure what we did. But I don't believe that we ever did simultaneously with using the pastels controls and also the ... the gray balance window. **Other person.** I have to say I have never tried it. It's just the way I would look to get around the problem. Because the pastel boost works is it removes the neutral components from a color. So as long as the color is not neutral it would do something to it. It would then boost the color in least saturated region. And what we have in ... is a ? that shows a bias toward the lighter colors and then towers off towards the deeper tones so that when you use this is doesn't boost the saturated colors at the same time. It just boost the desaturated colors. To adjust colors that are near neutral it should work but it does depend on whether you can get remove the gray balance window to a significant degree to be able to get something to work on and that could be the problem. So I know that gray balance window can be a problem in this particularly in this sort of color. You can see it there. It's switching from colors to neutral and I've seen that before. What I hope to do on one of there next versions of software to be somewhere off. Is to take out the gray balance window and do it in a different way. We did it once in 84 and that was when we were putting in the GCR program in and I took it down to customer site when we were running field trials. And ? some browns. Taking out the gray balance window just killed those browns completely. So I was thinking of putting a brown control in but I got convinced by customer service and their marketing people that it would be better to go back to what we had before to put the gray balance window back in and so that's what we did. But I'm not terribly happy with it for this reason. It always does that when you see strong reds going in to shadows. And red is where you notice more than anything, because it has such a big effect on the magenta and yellow. And it suddenly pulls the magenta and yellow

EXHIBIT C

Date of Meeting: Wednesday, May 27, 1992

Company Name/Address: MAN Roland
Graphic Center
BorsigstraBe 16
6052 Mulheim am Main
Telephone (069) 83 05 28 08
Fax (069) 83 05 24 76

Met With Position: Wolfgang SchweiBer/Head of Printing Services
Hellmuth Pleier/Department Head-Print Demonstration

Reason For Meeting: To view MAN Roland sheetfed presses.

Meeting Synopsis: The MAN Roland plant in Offenbach is their Sheetfed Demonstration, Training and Technical Research Facility.

We met with Wolfgang SchweiBer (head of printing services) and Hellmuth Pleier (department head of print demonstration.)

Hellmuth was very knowledgeable of the printing process as well as their presses. He had been a printer and was very technically oriented.

Our original meeting in the conference room discussed their experimenting with water-based metallic inks which are produced without using heavy metals. This was something they felt would be coming up in the near future, but they are not able to achieve the high-gloss effect that they get from the standard metallic inks at this time.

We discussed the use of fiber-optics on their presses. They said this was being done on the web presses, and they were now using fiber optics on the sheetfed presses. This is to get the information from the console/computer to the press. The data-transfer rate is specified as 625 Mb per second.

The Direct Imaging Press at Heidelberg also was discussed, and they think that technology will be used in the near future in the newspaper business. The ability to print with Direct Imaging on the large sheetfed presses is out of the question at this time because of the expense, and the materials used on the press.

Also, the amount of time to process a large sheet is much greater than that of a small sheet. The Direct Imaging is being done on a small press because of the space requirements and they have not been developed so they would fit on the large presses.

We discussed the future of printing presses and other technology. They said they felt like printers in the U.S. change out equipment much more rapidly than those in Europe. Gary and Jesse both were surprised that the places we went to see had so much new equipment considering the size of these companies.

Next we took a tour through their plant and the demonstration room, which was very overwhelming. Their demonstration room had at least, one of every press they made. A couple of the presses they had two of each. They bring people in from all over the world to demonstrate and test the presses here.

They also had another room where they had at least one of every press they made, and two or three of some. In this particular room they would tear the press all the way down to the floor and rebuild it. This was with the company's engineering and electrical people. Great idea for training.

We also looked at a Gravure sheetfed press that was in an experimental room. One of the people from MAN said that there was a dramatic increase for sheetfed Gravure work in Europe. This growth was partially based on the development of inexpensive, reusable cylinders.

They did show us a new sheetfed Gravure press they were working on that was a one color press.

About the fiber-optics, we did discuss that they were able to add a lot more functions and information from the press and to the press because of fiber-optics. It was able to handle a lot more different functions going through the fiber-optics than a standard wire. They felt like the more information that can be brought up on the monitor at the console will help improve the overall job considerably.

This is in the number of sheets you can run, the quality coming off the press, etc.

Hellmuth did say that the old style Miehle was a great press for the pressmen. It was easy to get between the units to work on rather than the new Komori-style presses. Their new 800 style is of the Komori-type design.

We discussed coating on jobs and they said that they were shipping a lot of eight-color presses to the states with tower coaters. They were the first to have the eight-color press in the U.S. and they did not know of any problems with the press, except having the inks adjusted to travel that far.

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PATENT
Our File: Will 2501

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Reissue Application of: BILL L. DAVIS and JESSE S. WILLIAMSON	
For Reissue of U. S. Patent 5,630,393 Issued May 20, 1997 Serial No. 08/515,097	Group Art Unit: 2854
Filing Date: May 20, 1999	Examiner: S. Funk
Serial No: 09/315,796	
For: COMBINED LITHOGRAPHIC/ FLEXOGRAPHIC PRINTING APPARATUS AND PROCESS	

THIRD SUPPLEMENTAL DECLARATION OF RAYMOND J. PRINCE

I, Raymond J. Prince, under penalties of perjury declare and state the following:

1. I am the same Raymond J. Prince who made declarations on or about May 19, 1999 submitted with the original application for reissue, and a supplemental declaration dated March 15, 2000, and a second supplemental declaration dated June 29, 2000. I reaffirm each of the statements made therein.

2. I have read U.S. Patent No. 5,638,752 ("the '752 patent") issued June 17, 1997 to Hartung, et al. of MAN-Roland Drucksmaschinen A.G. ("MAN-Roland") I noted that the '752 patent has an effective 1994 filing date and purports to have an April 3, 1993 German priority date. I have reviewed, again, the '363 patent to Davis, et al.

3. The '752 patent concentrates, starting at Col. 2, line 10 to Col. 3, line 32, Figs. 1-2 and Col. 3, line 54 to Col. 5, line 54, on the end-of-press double coater application as shown in Figs. 1-2. This configuration is used for many purposes, including the application of a waterbased coating and then a UV coating. Also, the '752 patent describes the use of a waterbased gold, and then overprinting the gold with UV coating. This last application is used in the printing of labels.

4. The only mention regarding the use of flexographic printing *prior* to the lithographic units in the '752 patent is an alternative or second embodiment, which starts at Col. 5, line 56. On the other hand, the '363 patent goes into great detail (teaching) why a printer would want to apply flexographic ink or coating prior to the offset lithographic units

as well as how to do it. The alternative '752 embodiment of the flexographic unit placed in front of the offset printing units has no clear reason given for doing this. Any general advantages are not pointed out, nor are the various types of work this technology would be used for. The '363 patent goes into great detail (teaching) why a printer would want to do this, as well as how to do it.

5. For the technology of the '752 patent to work, the flexographic coating/ink either waterbased or ultraviolet cured would have to be dried *prior* to a lithographic ink being printed on it, or in the case of a double coater, at the end of the press drying would have to occur between the two flexographic units, if two flexographic units are applied (suggestion in first embodiment at Col. 3, line 63). The '752 patent does not state or even mention in any part of the specification text or drawings Figs. 1-3 how one would solve the problem of trapping of the lithographic ink on top of a wet flexographic coating or wet flexographic ink. The '363 patent, on the other hand, clearly tells how this can be accomplished. If a press were configured as described in the '752 patent and as shown in Figs. 1-3, it would be, in my opinion, inoperable due to severe problems of trap, and the sheets would stick together in the press delivery. There is no teaching in the '752 patent of drying units, and such drying would have been necessary to practice the suggestion at Col. 3, line 63 for the first embodiment or for the second embodiment described starting at Col. 5, line 56. The '363 patent, on the other hand, clearly tells how drying can be accomplished. In the '363 Fig. 2, item 50 and Col. 4, line 52; Col. 4, line 62; Col. 6, line 43; Col. 7, lines 5, 29, 45 describe a high velocity hot air dryer.

6. The '752 patent does not teach perfecting, while the '363 patent clearly indicates perfecting and teaches the advantages. This is clearly pointed out in the many references in the '363 patent to continuous in-line process descriptions.

7. The ' 752 patent is a very general patent with no detailed mechanical description as to an "up front" flexographic unit. The '752 patent mentions in a second embodiment printing a flexographic ink or coating prior to a lithographic ink Col. 5, line 61 to line 63 as a system to apply zinc white (opaque) coatings – there is no teaching whatsoever of any reasons why the artisan or printer would want to do so. The '363 patent, on the other hand, teaches the following advantages: the printing of white at Col. 3, lines 40-46; colors that need a high film thickness at Col. 3, lines 47-52; printing "scratch and sniff" coatings at Col. 3, lines 53-56; metallic inks at Col. 3, lines 60-67.

8. The '752 patent does not expressly teach the use of an anilox (common terminology in flexography) roller. The teaching of application roller 21 at Col. 4, lines 11-14 having a "structural surface including small cups" is awkward, if not misleading if an anilox roller was intended. The '363 patent defines and expressly teaches the use of an anilox roller, Col. 1, lines 16-33; Col. 6, line 24; Col. 6, line 38; Col. 7, line 41; Col. 10, line 50, 65.

9. The '752 patent does not teach the use of flexographic plates. It does teach the use of a typographic plate or "form"(Col. 5, lines 32-36) that is "stretched". I am not at all sure what is meant by this type of plate. Typographic plates are not used in flexography, nor is the plate "stretched".

10. Looking at Col. 5, lines 48-67 and Col. 6 of the '752 patent up to claim 1, I see important deficiencies for an adequate teaching. Lines 48-55 of Col. 5 champion the idea of a double coater, triple tower, i.e. waterbased coater, in-line dryer, and then a UV coating or other coating. The types of coatings are not clearly specified. This "double coater" technique was developed for the label industry in an effort to improve productivity and eliminate bronzing of labels. Bronzing is expensive, but the look of the gold is very good. The double coater, triple tower press has seen some success in the label and folding carton industry, but not in the commercial field due to many technical issues. The '752 patent refers to two coaters – of which one is a flexographic unit in the emphasized embodiment -- at the end of a press. In this arrangement, gold pigment would be placed (mixed into a waterbased coating) and then applied to a sheet and top protective coating applied in "second lacquering unit 17". By reading this portion of the '752 patent, one of ordinary skill would have to do extensive experimentation, in my opinion, to make this work since it is clearly not pointed out in the '752 patent. As stated, the '752 patent does not indicate how the drying is to occur – nor does it give any guidance on coatings.

11. Lines 55-62, Col. 5 of the '752 patent, states for the second embodiment that "zinc-white coatings" can be applied ahead of the lithographic units. These coatings are used in metal decoration and in conjunction with printing process color on colored stocks. Why this is done is *not* stated in '752 patent nor is how that coating can be dried. If one of ordinary skill were to try this based on what is in the patent, a mess would occur on the press with all of the inks mixing together.

12. The '752 patent also suggests (Col. 3, lines 63-64) for the *second* embodiment that the "second lacquering unit 17" can be flexographic, but like the suggestion for the first embodiment at Col. 3, line 63, the details of this alternative are never explored.

13. Col. 6, lines 1-10 of the '752 patent try to encompass everything that they may have forgotten. Lines 1-4 refer to "particular embodiments" that are disclosed. In my opinion, only two embodiments were disclosed, the second starting at Col. 5, line 56 of Fig. 3. As stated above, the first embodiment of Col. 2, line 10 to Col. 5, line 55 and Figs. 1-2 is, in my opinion, *very* questionable as to its enablement, especially with respect to the alternative that both units 16 and 17 are flexographic. The second embodiment starting at Col. 5, line 56 of Fig. 3 is certainly not enabling, in my opinion. Once again, a person skilled in the art would have to spend a great deal of time and effort in the research lab to make the second embodiment work. Lines 6-10 of Col. 6 of the '752 patent again are most confusing discussing interspersed coating units that may help dry the sheet. A coating unit *coats* -- it does not *dry* a sheet.

14. Most importantly, if one of ordinary skill in the art were to start designing a machine in the spring of 1994 using the second or "up front" flexographic embodiment of the '752 patent process, a great deal of experimentation and work would be needed. The '752 patent "process" using a flexographic step "up front" would not work due to the fact that the coating or ink applied would not be dry prior to the next lithographic printing unit. For that reason, the disclosure at the bottom of Col. 5 and top of Col. 6 and Fig. 3 does not enable one of ordinary skill in the art to practice offset lithography using a flexographic step "up front".

15. As an expert in the printing arts, I have followed the improvements and advances in the printing presses for the last twenty-five years. I have followed the introduction of the various models of the MAN-Roland presses. The '752 patent appears to pertain to the second or third of the "Roland 700" series, this is one is the so-called "Plus Single Coater", having end-of-press double tower coaters, of which the one sold commercially had one anilox roller. The Roland 700 series was first launched in 1990 at DRUPA, but as I recall, without an anilox roller. The improvement with an anilox roller was first introduced into the marketplace, as I recall, in the fall of 1993 with the IPEX Exhibition in England using an end-of-press anilox roller. The "Double Coater" series (end-of-press) was launched at DRUPA in early May 1995 having a drier at end-of-press between *two* end-of-press flexographic anilox rollers. I do not recall any of the "Roland 700" series

advertisements between IPEX 1993 and January 1, 2000 offering the purchaser the alternative of placing the anilox roller "up front". I conclude from the failure of MAN-Roland to do this that either they did not appreciate the benefits as taught in the '363 patent or did not wish to do it.

The undersigned Declarant stated further that all statements made herein of Declarant's own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Raymond J. Prince

Date: 9/11/2000

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US005476042A

United States Patent [19]

Ehrhard et al.

[11] **Patent Number: 5,476,042**

[45] **Date of Patent: Dec. 19, 1995**

[54] **METHOD AND APPARATUS FOR APPLYING A LIQUID MEDIUM TO A PRINTING CARRIER IN OFFSET PRINTING MACHINES**

[75] Inventors: **Toni Ehrhard**, Breuberg; **Georg Hartung**, Selignestadt; **Manfred Herold**, Hainburg; **Ulrich Jung**, Limburg, all of Germany

[73] Assignee: **MAN Roland Druckmaschinen AG**, Germany

[21] Appl. No.: **279,236**

[22] Filed: **Jul. 22, 1994**

[30] **Foreign Application Priority Data**

Jul. 22, 1993 [DE] Germany 43 24 631.1

[51] **Int. Cl.**[6] **B41F 31/00**

[52] **U.S. Cl.** **101/352**; 101/210; 101/485; 101/366

[58] **Field of Search** 101/207–211, 348, 101/349, 350, 351, 352, 363, 366, 483, 485, 486, 247; 118/258, 259, 248, 261, 262; 427/428

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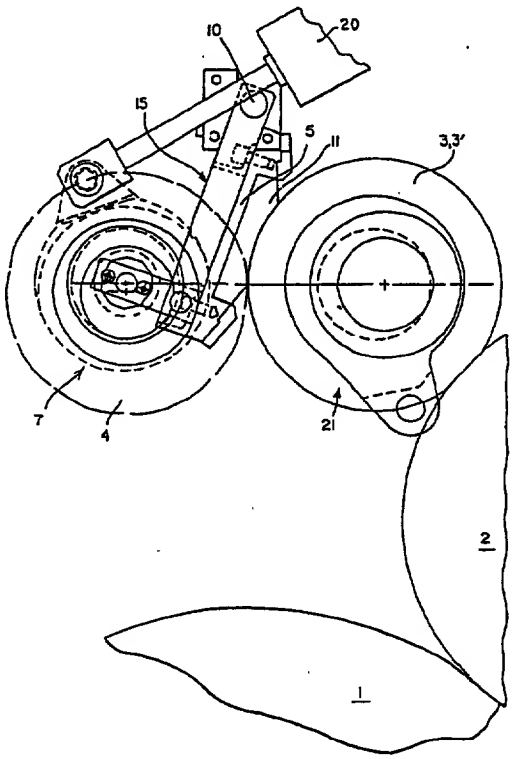
Primary Examiner—Chris A. Bennett
Attorney, Agent, or Firm—Leydig, Voit & Mayer, Ltd.

[57] **ABSTRACT**

A method and apparatus for applying a liquid medium to a printing carrier in offset printing machines. It is suitable for processing media of different viscosity, such as low-viscosity dispersion lacquers or higher-viscosity bronze and effect printing inks. In order to guarantee precise metering, two function modules are assigned in an exchangeable manner to a forme cylinder in two bearings. If processing of low-viscosity media is required, the first function module, consisting at least of a metering roller and an applicator roller, is used. For processing higher-viscosity media, the second function module, consisting at least of a screened applicator roller and a chamber-type doctor, is used.

6 Claims, 3 Drawing Sheets



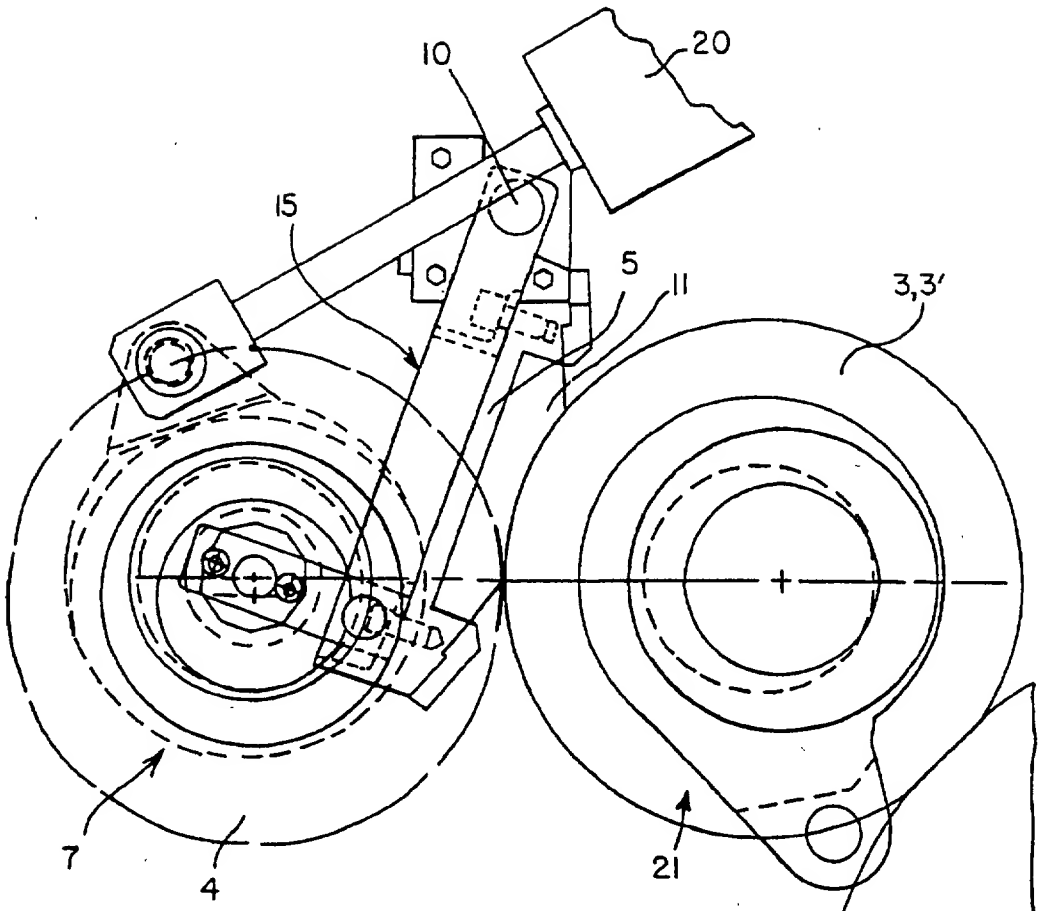
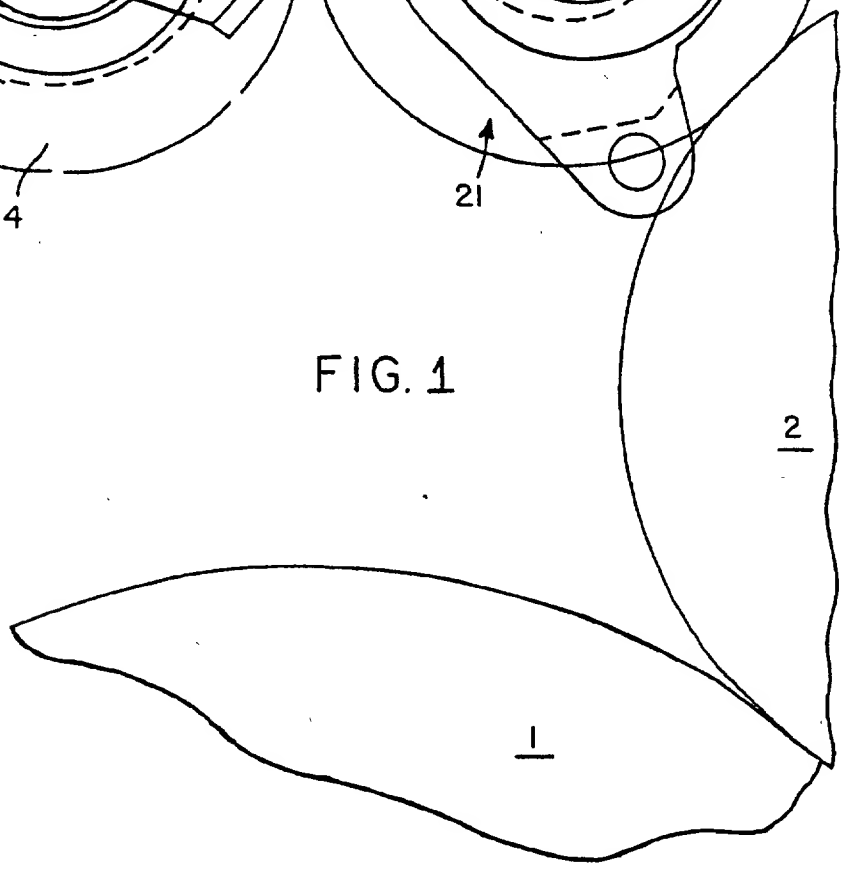


FIG. 1



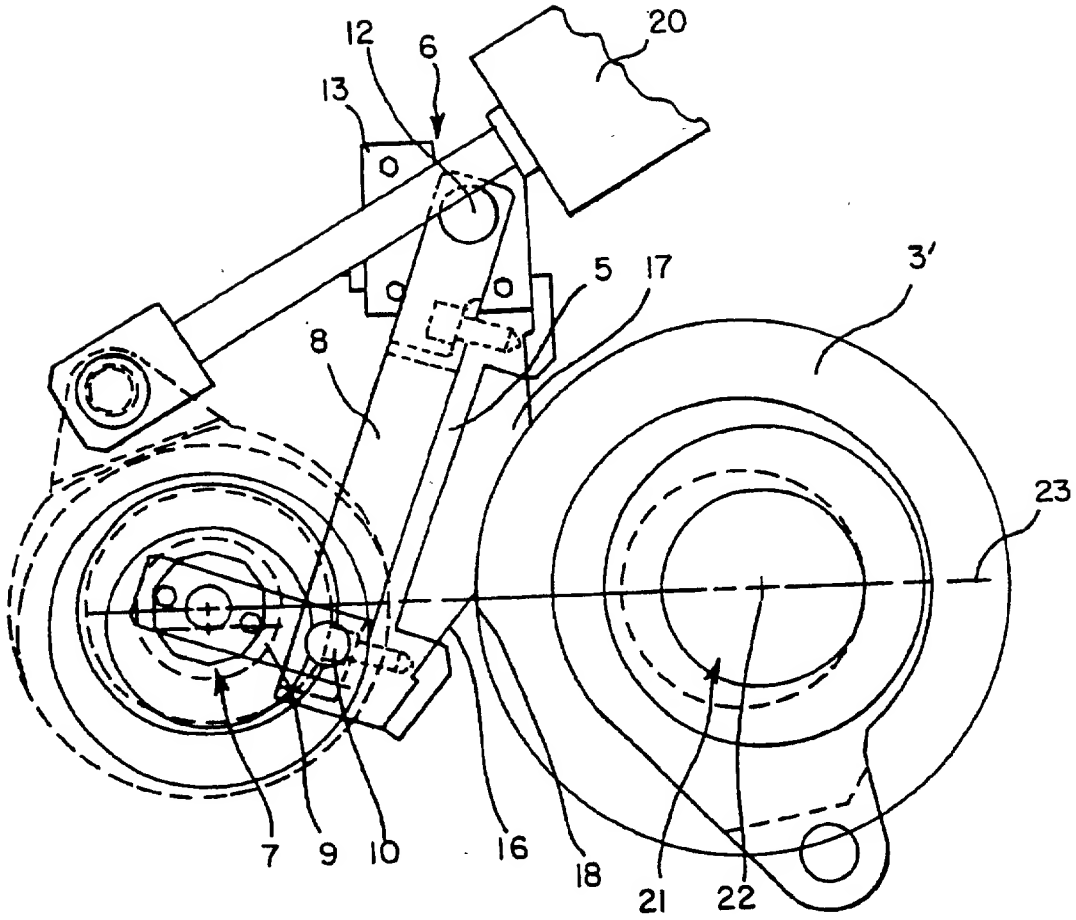


FIG.2

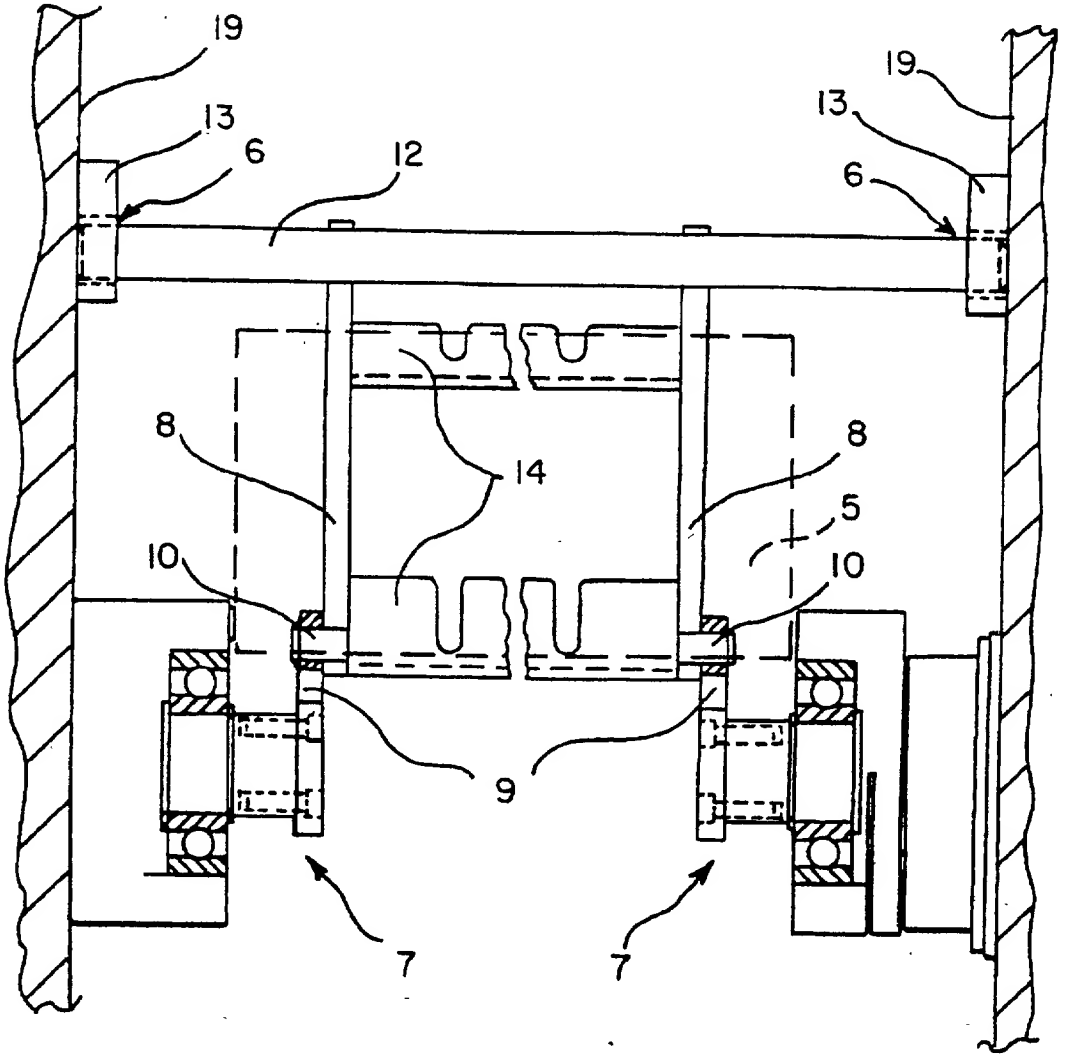


FIG. 3

METHOD AND APPARATUS FOR APPLYING A LIQUID MEDIUM TO A PRINTING CARRIER IN OFFSET PRINTING MACHINES

BACKGROUND OF THE INVENTION

This invention relates to a working method and an apparatus for applying a liquid medium to a printing carrier in offset printing machines. The apparatus is suitable for processing low-viscosity and higher-viscosity media, such as, for example, dispersion lacquer on an aqueous basis (low-viscosity with a viscosity ≦0.1 Pa s) or bronze and effect printing ink with a specific pigment proportion (higher-viscosity with a viscosity of 0.1 to 2 Pa s) such as, for example, gold lacquer.

Various arrangements are known for applying liquid media to a printing carrier. According to DE 3,427,898 C1, the metering of the medium to be applied takes place by means of a metering roller and an applicator roller according to the principle of squeeze rollers, the liquid (e.g., lacquer) being supplied to the roller gap by means of a tube so as to form a lacquer wedge.

A chamber-type doctor is known from EP 0,071,180 A1 and is essentially forme by a housing with side walls and doctor blades, also called squeegees, attached to the housing. The doctor blades are supported on the applicator roller, and the liquid is transferred to the screened applicator roller via the chamber thus forme. In this case, the chamber-type doctor is pivotably mounted in a holder arranged above the applicator roller and can be engaged against the applicator roller by an operating cylinder acting on the holder.

The known arrangements are disadvantageous in that they do not guarantee precise metering of the medium to be applied in the case of media of different viscosity. The known arrangements thus cannot be used universally for applying the respectively used liquid to the printing carrier.

SUMMARY OF THE INVENTION

The general object of the present invention is to eliminate the disadvantages of the prior art and specifically to achieve this by enabling the metering roller and the chamber-type doctor to be exchanged quickly in combination with the respective applicator roller as function modules in an offset printing machine.

When processing low-viscosity media (≦0.1 Pa s), the first function module is used. An applicator roller (rubber-coated or steel) and a metering roller (steel or rubber-coated) are inserted in each case into the laterally fixed, eccentric bearings for the applicator roller and metering roller.

When processing higher-viscosity media (≧0.1 to 2 Pa s), the second function module is used. A screened applicator roller is then inserted in the above-mentioned eccentric bearings and a chamber-type doctor is inserted in the bearing for the metering roller. The eccentric bearings for the first function module (applicator roller/metering roller) thus serve at the same time to receive the second function module (screened applicator roller/chamber-type doctor) after the first function module has been exchanged from the bearings. The printing engagement with the applicator roller takes place by means of a single engagement bearing (for the metering roller or the chamber-type doctor). Economic processing of liquid media in in-line operation of an offset printing machine thus becomes possible. The apparatus can be converted within a short time for processing the respective medium and guarantees precise metering of the liquids.

In this case, the apparatus can be arranged upstream of the first printing unit of an offset printing machine for finishing (e.g., lacquering) applying covering layers, arranged between the printing units or arranged downstream of the printing unit. The solution according to the invention is suitable for spot lacquering (intermittent lacquering) and for full-surface lacquering. A further finishing apparatus can likewise be arranged upstream or downstream of the apparatus according to the invention, for example, a further lacquering unit for full-surface lacquering or a laminating or embossing apparatus.

These and other objects and advantages of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows the basic construction of the apparatus of the invention, the metering roller and the chamber-type doctor being illustrated superimposed.

FIG. 2 is an enlarged side view showing the apparatus for processing higher-viscosity media.

FIG. 3 is a front view showing the bearings of the chamber-type doctor.

While the invention is susceptible of various modifications and alternative constructions, a certain illustrated embodiment hereof has been shown in the drawings and will be described below in detail. It should be understood, however, that there is no intention to limit the invention to the specific form disclosed, but on the contrary, the intention is to cover all modifications, alternative constructions and equivalents falling within the spirit and scope of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In an offset printing machine, the apparatus according to the invention is arranged downstream of the last printing unit and serves for the in-line lacquering of printing carriers. In this case, the apparatus consists of a sheet-feeding cylinder 1 to which a forme cylinder 2 is assigned. An applicator roller 3 is assigned to the forme cylinder 2. Assigned optionally so as to be engageable against the applicator roller 3 is a metering roller 4 or a chamber-type doctor 5. The cylinder 1, the forme cylinder 2, the applicator roller 3, the metering roller 4 and the chamber-type doctor 5 are mounted in laterally spaced frames 19 (FIG. 3), the metering roller 4 and the applicator roller 3 being received in eccentric bearings 7 and 21, respectively. The metering roller 4 and the applicator roller 3 are received in each case in bearings 7, 21 of two-part construction so that the upper parts are connected releasably in a positive-locking manner to the lower parts of the bearings 7, 21 attached in the side frames 19. The bearing 7 of the metering roller 4 is designed in each case as an engagement bearing 7 in the form of an eccentric bearing. Arranged on the engagement bearing 7 is an actuating means 20, for example, an operating cylinder, for printing engagement (engagement/disengagement of printing). A pivoting bearing 6 is arranged as a bearing for the chamber-type doctor 5 above a roller gap forme by the metering roller 4 and applicator roller 3 on both sides in the side frames 19. The chamber-type doctor 5 is attached releasably to a frame 15, for example, consisting of supports 8 and struts 14, by means of quick-acting closures. The

supports 8 are arranged on a crossmember 12 of circular construction, the crossmember 12 and the bearing plates 13 forming in each case a pivoting bearing acting as a hinge. A coupler 9 is linked to the frame 15 on both sides, in each case by a hinge 10. The coupler 9 is furthermore rotatably linked to each engagement bearing 7 which otherwise also receive the metering roller 4. The chamber-type doctor 5 attached to the frame 15 has, in addition to a screened applicator roller 3', a positively inclined closing doctor blade 17 and a negatively inclined working doctor blade 16. In this case, the working doctor blade 16 is supported on the circumference of the screened applicator roller 3' at a point of engagement 18 which lies on a line 23 at the height of the middle 22 of the eccentric bearing 21 of the applicator roller 3'. The chamber-type doctor 5 has an apparatus for supplying and removing the medium to be processed in each case, which apparatus is not described in detail here. Two function modules can thus be assigned to the forme cylinder 2.

The first function module may be forme by the metering roller 4 in a steel construction and the applicator roller 3 with rubber coating. The forme cylinder 2 carries, for example, a rubber blanket for full-surface lacquering. Alternatively, the metering roller 4 may be provided with a rubber coating and the applicator roller 3 may be constructed of steel. In this case, the forme cylinder 2 carries a flexographic printing plate or an intermittent rubber blanket for intermittent lacquering (spot lacquering).

The second function module is forme by the chamber-type doctor 5, the frame 15, the pivoting bearing 6 and an applicator roller 3' with a screen well structure. The screened applicator roller 3' is constructed, for example, of ceramics.

The functioning of the apparatus is as follows: If a conventional, low-viscosity lacquer is processed, the first function module is used. The metering roller 4 and the applicator roller 3 receive the lacquer to be processed via a feed pipe (not shown) in the roller gap 11 so that a lacquer wedge is forme therein. By actuating the cylinder 20, the eccentric engagement bearing 7 is pivoted in such a way that the metering roller 4 is engaged with or disengaged from the applicator roller 3 in printing engagement or disengagement of printing, respectively. The metering takes place according to the principle of squeeze rollers, and the applicator roller 3 conveys the lacquer to the forme cylinder 2 which transfers the lacquer to the printing carrier in conjunction with the sheet-feeding cylinder 1.

If an application with higher-viscosity lacquer such as, for example, bronze or effect printing ink, is to be processed, the second function module is used. For this purpose, the upper part of the engagement bearing 7 is released and the metering roller 4 is taken out. The lacquer feed pipe is removed from above the roller gap 11, and the upper part of the bearing 21 of the applicator roller 3 is opened so that the roller 3 can likewise be removed. A screened applicator roller 3' is placed in the applicator roller bearing 21 and the upper part of the bearing 21 is re-connected to the lower part. The coupler 9 with the frame 15 and chamber-type doctor 5 is inserted in the engagement bearing 7 and the upper part of the engagement bearing 7 is connected to the lower part. Beforehand, the frame 15 with the crossmember 12 is placed in the pivoting bearing 6. The chamber-type doctor is coupled to a lacquer supply and a lacquer removal. The chamber-type doctor 5 is engaged (engagement/disengagement of printing) with the applicator roller 3' by the actuating cylinder 20 acting on the engagement bearing 7. In this case, the working doctor blade 16 engages at the height (line 23) of the middle 22 of the bearing 21 of the applicator roller 3' on the circumference thereof in the point of engagement 18 in order to vary the engagement conditions as little as possible when adjusting the eccentric bearing 21.

If after the use of higher-viscosity lacquer, low-viscosity lacquer is to be processed again, the upper part of the engagement bearing 7 is removed and the coupler 9 with the frame 15 and the chamber-type doctor 5 is taken out. Beforehand, the chamber-type doctor 5 is emptied and the supply lines are disconnected.

Advantageously, the crossmember 12 can remain in the bearing plate 13 of the pivoting bearing 6, and the coupler 9, the frame 15 and the chamber-type doctor 5 may be pivoted into a parked position above the engagement bearing 7 and retained there. The screened applicator roller 3' may be removed from its bearing 21, and an applicator roller 3, e.g., of steel construction, may be inserted and fixed in such bearing. Inserted in the engagement bearing 7 is the metering roller 4 which was previously deposited (parked), for example, in a roller holder on the machine housing. The metering roller 4 is engaged (engagement/disengagement of printing) with the applicator roller 3 by the actuating means 20 arranged on the eccentric engagement bearing 7. Beforehand, the lacquer feed pipe was again positioned above the roller gap 11 and coupled to a feed line. The metering roller 4 has a separate drive which is coupled to the applicator roller 3. Two freewheels are arranged on the axle of the applicator roller 3. One freewheel is coupled to the separate drive of the metering roller 4, and the other freewheel is coupled to the train of gears of the printing machine (input drive). During printing engagement, the input drive of the printing machine overtakes the separate input drive of the metering roller 4. During disengagement of printing, the input drive of the machine is disconnected (stopped) and the separate input drive continues to drive the applicator roller 3. The lacquer is thus prevented from drying on the roller surface. When using the chamber-type doctor 5, the procedure is analogous since the drive is coupled only to the bearings 7, 21.

We claim:

1. A method for applying different types of liquid media to the forme cylinder of offset printing apparatus having applicator roller means engageable with said cylinder and having laterally spaced bearings, said method comprising the steps of, supporting a metering roller with said bearings, moving said bearings to shift said metering roller into engagement with said applicator roller means, and metering a first liquid medium between said metering roller and said applicator roller means, moving said bearings reversely to shift said metering roller out of engagement with said applicator roller means, removing said metering roller from said bearings, supporting a chamber-type doctor with said bearings, moving said bearings to shift said chamber-type doctor into engagement with said applicator roller means, and metering a different liquid media onto said applicator roller means by way of said chamber-type doctor.

2. A method as defined in claim 1 in which said apparatus includes second bearings and in which said applicator roller means comprise first and second different types of applicator rollers selectively supportable by said second bearings, said method comprising the steps of, supporting said first type of applicator roller in said second bearings when said metering roller is supported by said laterally spaced bearings, and removing said first type of applicator roller from said second bearings and supporting said second type of applicator roller in said second bearings when said metering roller is removed from said laterally spaced bearings and said chamber-type doctor is supported with said laterally spaced bearings.

3. Apparatus for applying different types of liquid media to a forme cylinder, said apparatus comprising a first set of laterally spaced bearings, a second set of laterally spaced bearings, means for moving said first set of bearings toward and away from said second set of bearings, first and second different applicator rollers selectively supported by said second set of bearings and engageable with said forme cylinder and a metering roller and a chamber-type doctor selectively supported by said first set of bearings.

4. Apparatus as defined in claim 3 in which said metering roller is supported by said first set of bearings and said first applicator roller is supported by said second set of bearings when low-viscosity media is applied to said forme cylinder, said chamber-type doctor being supported by said first set of bearings and said second applicator roller being supported by said second set of bearings when high-viscosity media is applied to said forme cylinder.

5. Apparatus as defined in claim 4 further including means mounting said chamber-type doctor for swinging away from said first set of bearings to a parked position when said metering roller is supported by said first set of bearings.

6. Apparatus as defined in claim 4 in which said chamber-type doctor includes a working doctor blade which is inclined negatively relative to said second applicator rolls when said chamber-type doctor is supported by said first set of bearings and said chamber-type doctor is supported by said second set of bearings, said doctor blade engaging said second applicator roller in a generally horizontal plane containing the axis of said second applicator roller.

* * * * *

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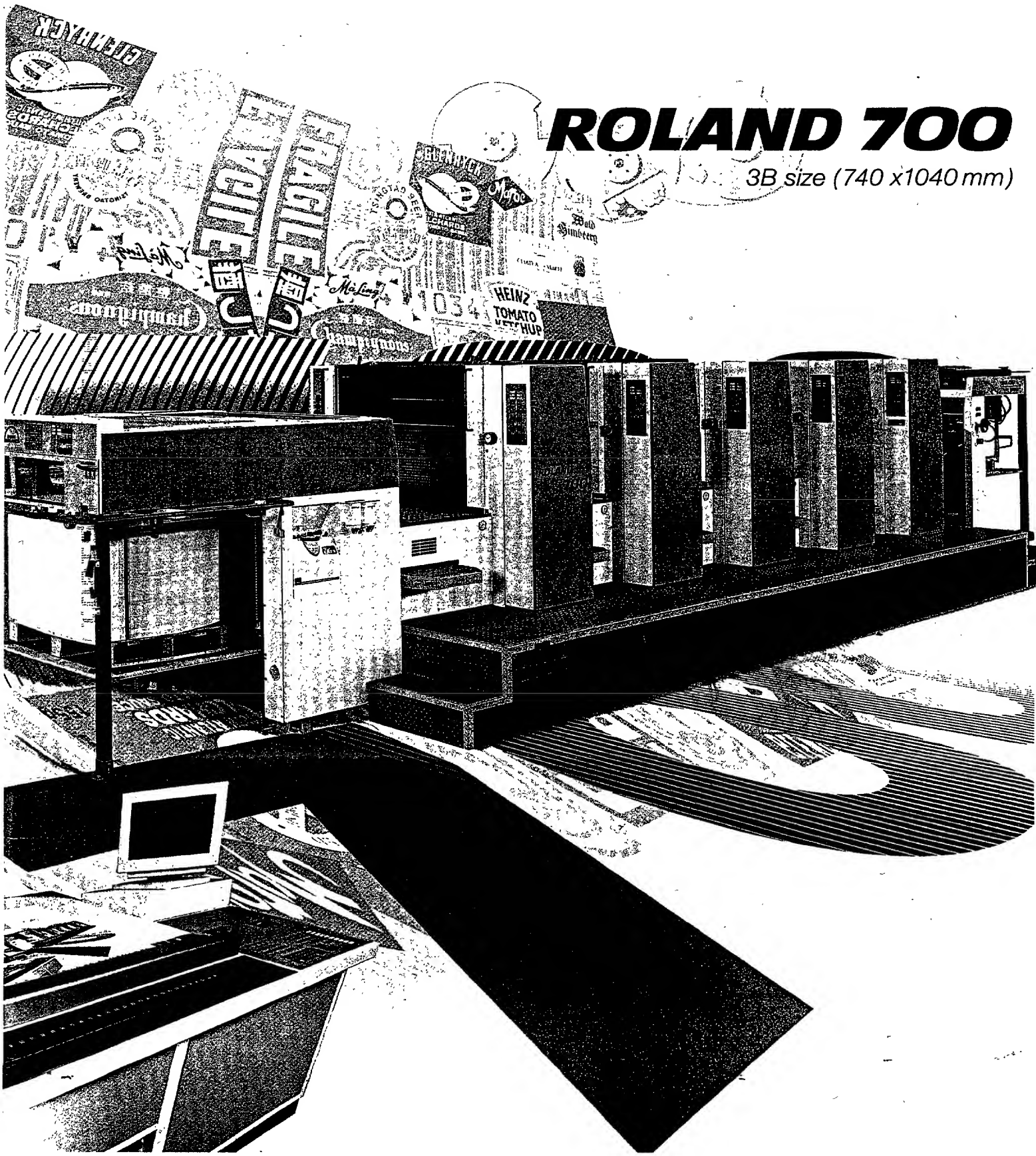
MAN ROLAND

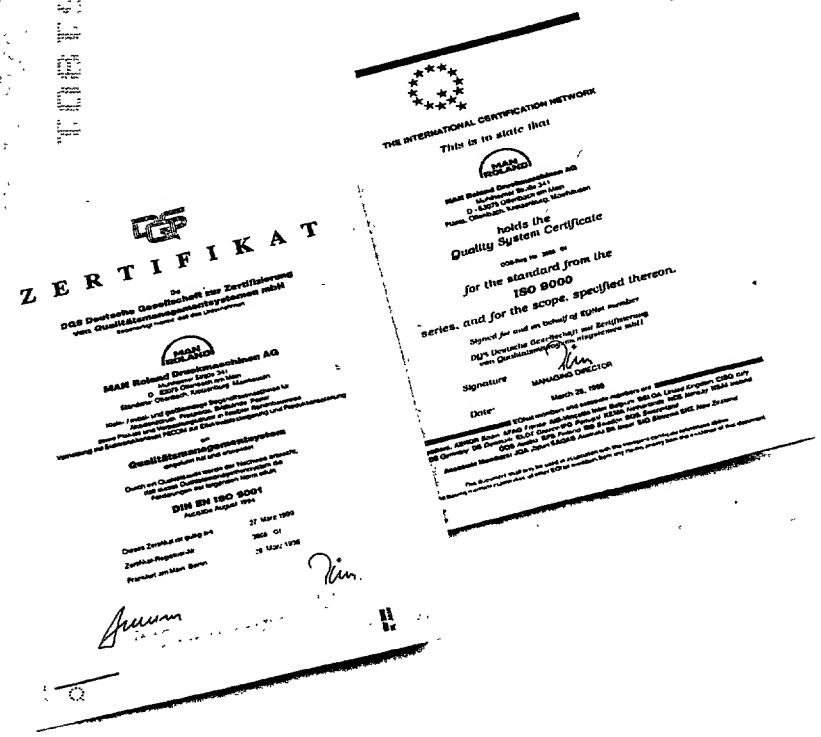
ROLAND 700

3B size (740 x1040 mm)



An investment in quality

MAN Roland has received DIN EN ISO 9001 certification from The German Association for Certification of Quality Management Systems for the sheetfed press production locations in Offenbach, Krotzenburg and Mainhausen. This attests to a high level of quality management in every phase of production. MAN Roland customers are thus assured that they are investing in printing presses that are developed and manufactured to the highest quality standards.



ZERTIFIKAT

DIN EN ISO 9001

THE INTERNATIONAL CERTIFICATION NETWORK

This is to state that

MAN ROLAND

holds the

Quality System Certificate

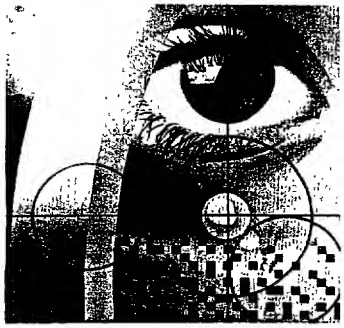
for the standard from the

ISO 9000

series, and for the scope, specified thereon.

Signature MANAGING DIRECTOR

Date March 29, 1996



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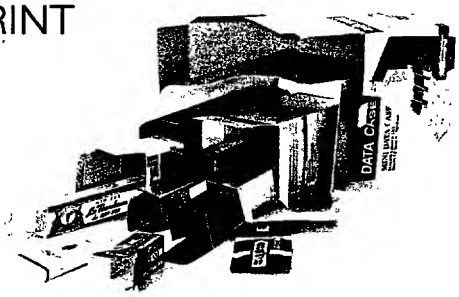
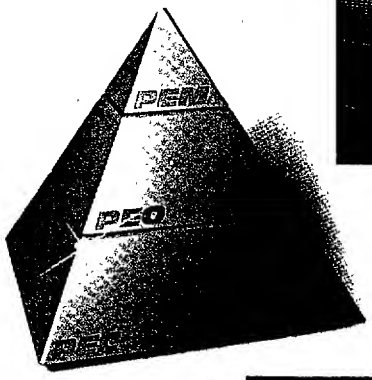
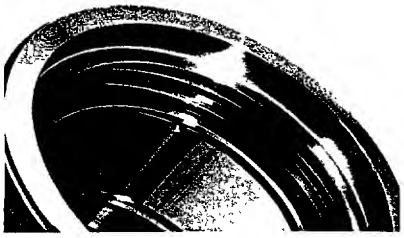






Contents

This brochure describes the presses of the Roland 700 series, including optional equipment. Please refer to the enclosed list of equipment for information on the different versions available. For further details, please contact our sales and service partner for your area. We reserve the right to make changes without prior notice.

Commercial printing – economy through extensive automation

The demands placed on general commercial plants are constantly changing. Run lengths are decreasing, quality expectations are increasing. You can only operate profitably when you are able to produce fast and in high quality. The Roland 700 uses highly-automated technology to speed up and simplify the printing process. And this gives you a clear lead in a very competitive marketplace.

Short makeready times with maximum quality security. Flexible job handling with optimal utilization of resources. These are the advantages that the Roland 700 in the sheet size 740 x 1040 mm offers you. The conception of this press provides the ideal response to the demands placed on today's commercial printing plants.

Fast into print

Diminishing run lengths and an ever increasing diversity in the nature of jobs require extremely flexible methods for fast changeover. The Roland 700 is quickly and easily set up for a new sheet size and a different stock. For example, automatic sheet size setting and automatic plate changing permits a five-colour Roland 700 to be changed over in less than ten minutes.

EUMS

graph

An all-rounder

The Roland 700 meets all the demands that can possibly be made on a commercial printing plant. Available with up to eight printing units, and with the opportunity to add a coating module or a perfecting system, it covers the entire spectrum. And, with its maximum speed of 15,000 sheets per hour, it can also produce long runs extremely economically. Another advantage: the Roland 700 can handle a wide variety of stocks, from the thinnest paper through to board and special materials such as foil. Precision engineering and design from the feeder right through to the delivery ensures safe and reliable sheet travel.

Networked operations unites the individual production processes

PECOM is the name of MAN Roland's process electronics concept that links the various production processes into a network. One-time generated data is available at any time to all areas in the plant.

Computer-precise work preparation, clear cost determination and simple job accounting are only a few of many advantages provided by the Roland 700 operating in a network. The technical prerequisite for this is the PECOM Press Center and this is standard equipment.

Packaging printing – production on an industrial scale

Efficient packaging printing demands industrial manufacturing methods. With a printing press that can be integrated as a component in your entire manufacturing process, you can significantly increase productivity. The highly-automated Roland 700 gives you real advantages in an increasingly competitive market.

Sophisticated internal logistics systems are especially important in packaging printing. As a component of the PECOM process electronics system, the console-controlled Roland 700 can be linked to the other production operations in your plant. This considerably increases manufacturing efficiency and output.

Networking also provides clear cost information

Through the PECOM Press Center, the Roland 700 can be integrated into your plant's data network. This enables all jobs to be prepared at the TPP station and then transferred online to the press, thus increasing throughput. Computers at the management level have instant access to operational data and this provides clear cost information.

Almost everything: the wide range of stocks

Heavy board, paper for laminating or special materials such as foil: the Roland 700 comfortably prints all packaging stocks in the highest quality. Secure sheet guiding and the special design using double-diameter impression cylinders and Transferters ensure optimal sheet travel through the press – for heavy board as well as the thinnest label papers.

Fewer waste sheets – lower costs

Less overs can save a lot of money - especially with expensive materials used in packaging. PPL automated plate changing ensures precise register from the first sheet. When printing is interrupted, inking unit separation enables you to return to production quality inking very quickly. The Roland Deltamatic dampener removes hickeys. These features, along with central print quality monitoring from the PECOM Press Center, all contribute to a dramatic reduction in material wastage.

Automated production for higher quality

The elimination of numerous manual tasks gives the printer more time to concentrate on print quality. The highly-automated technology of the Roland 700 not only results in increased capacity but also ensures consistently high quality and satisfied customers.

Printing and coating in one sheet pass

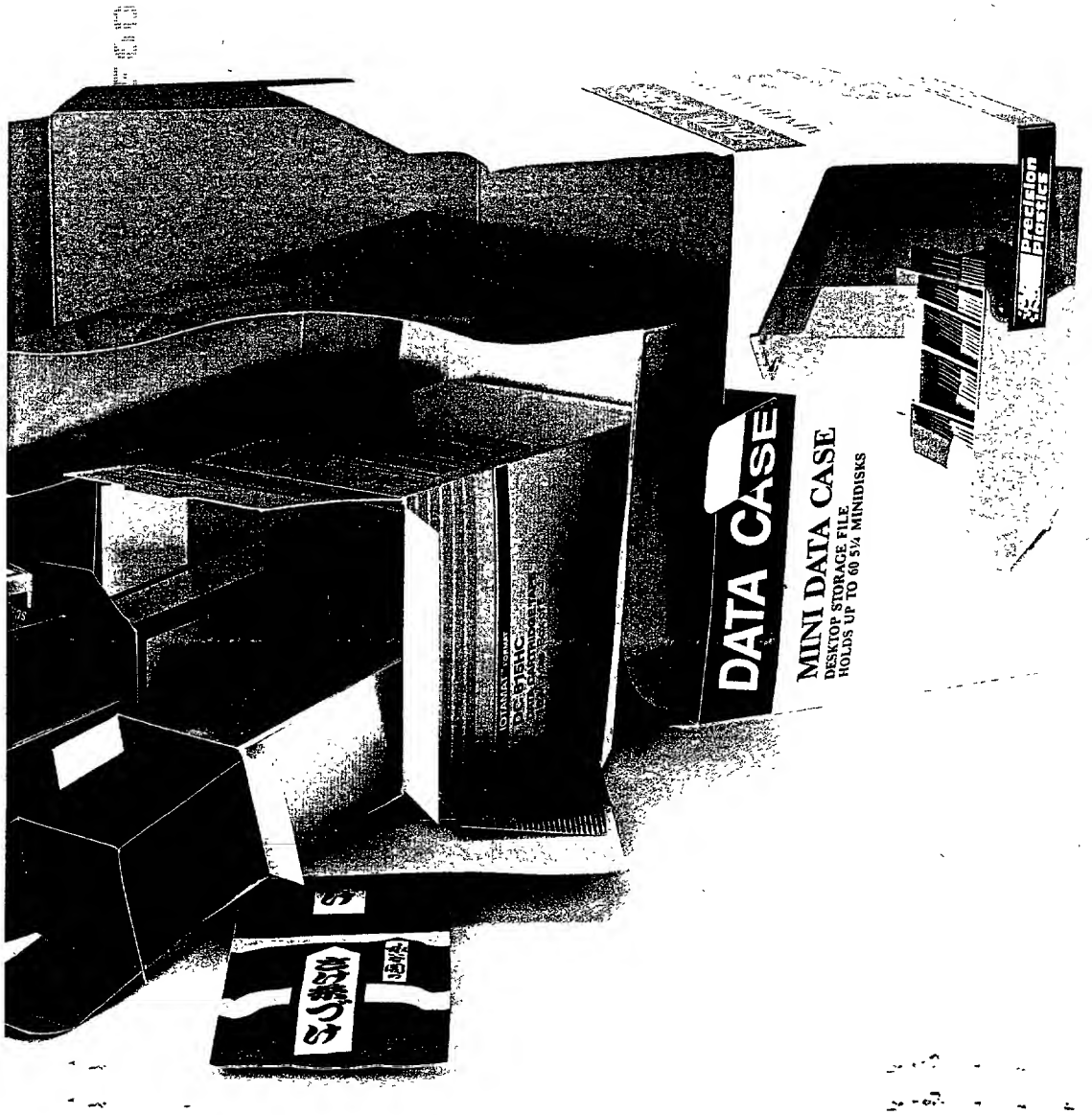
With the Roland 700 coating modules and the Roland Seccomatic dryers, you can print, coat and dry in one sheet pass. By using two coating modules, you can apply different types of coating – using different application methods – in one run.

Automation in the periphery increases throughput

Carton printers in particular appreciate the value of pile changing at full production speed. This is made possible by non-stop feeder and delivery systems and a new intermediate piling device that all combine to reduce your production time. You can increase your throughput even more by equipping the Roland 700 with the AUPASYS fully-automated pallet transport system.

Consistent colour without external control bars

Packaging printing demands a consistently high ink charge. And packaging stocks are expensive. The Roland CCI 2D inking regulation system measures single-colour areas directly in the image or colour control bars located wherever you choose. This ensures consistent colour without any additional space having to be reserved for control bars.



Special applications – equipment for all purposes

Versatility and specialization need not be a contradiction. This is proven by the Roland 700 with its wide range of applications, excelling in special areas such as stamp printing, printing on foils and book printing. This is partly due to the wide range of equipment available. With a reel sheeter, inking unit temperature control or coating modules, the Roland 700 is a very profitable investment also for special applications.

Minimizing waste of expensive materials

Special applications often involve very expensive materials and spoilage is therefore very costly. The Roland 700 has many automation and equipment features that keep spoilage at an extremely low level. The PECOM Pre-Press Interface enables picture data to be taken over directly from the pre-press area and used for inking presettings. Or this data can be determined by the Roland EPS plate scanner. With repeat jobs, all job data from the previous run can be retrieved from the job database. Whichever method he chooses to obtain the data, the printer comes up to colour faster and this minimizes waste.

The substrate can also be special...

Also substrates that are generally difficult to feed can be handled by the Roland 700 without problems. Examples of these are metalised papers or very thin foil. The RB 70 reel sheeter is especially efficient with this type of material.

Foil: well printed and quickly dried

Fast drying of the ink is particularly important with non-absorbent substrates. The range of Roland Seccomatic drying modules for intermediate and end of press drying using IR, hot air and UV methods assure you of excellent results on all materials.

Postage stamp printing demands high precision

High quality and the shortest possible makeready times also make special applications such as postage stamp printing economically viable. With the PPL automatic plate loading system, 95% of jobs require no register correction after the plates are mounted. The RQM register magnifier is very effective with the exact fitting of a high number of very small multiple-up images and also offers a maximum of operating comfort.

Book printing: single-cylinder perfecting for varying production modes

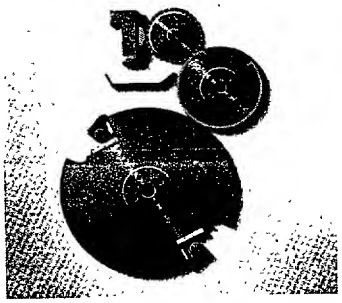
When the job structure is varied and includes book printing for instance, the Roland 700 perfecting system offers you a very high degree of flexibility and this means considerable productivity advantages. From 1/1 colour through 4/4 colours – the book signature can be printed in one sheet pass.

Waterless offset: high quality on non-absorbent substrates

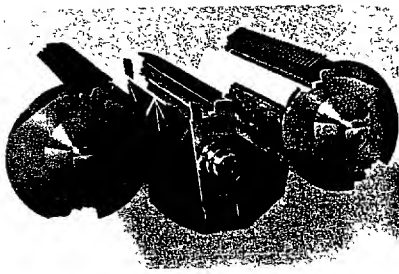
Inking unit temperature control ensures especially stable conditions in the printing unit. This has advantages for conventional offset but even more so for waterless, providing the temperature stability that this process needs. Two variants are available for the Roland 700: temperature control that can be regulated for all units together or for each individual unit. The Deltamatic dampener can also be used when printing waterless to remove hickeys. A suction device is also available that prevents particles from reaching the plate in the first place.

A tour of the press

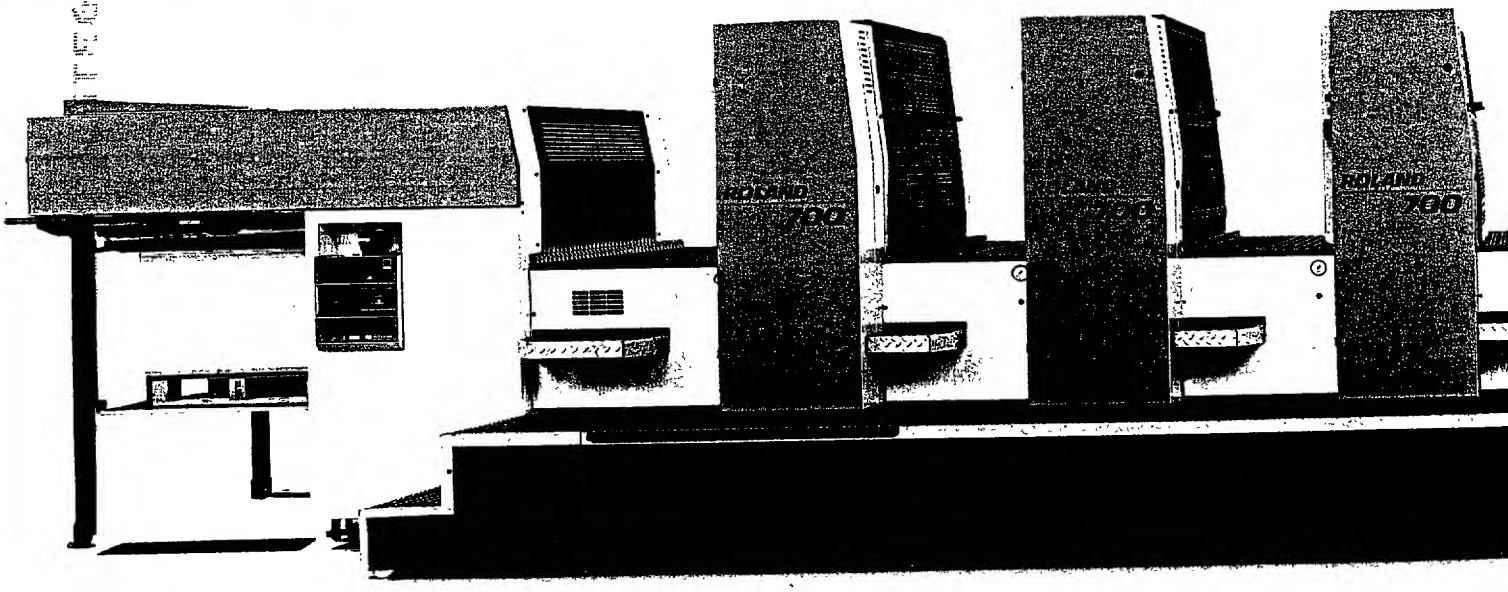
Central press operation and control from the PECOM Press Center.

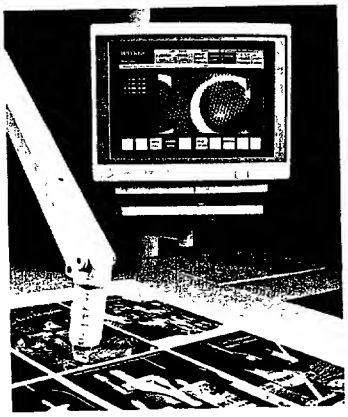


Inline enhancement: the chamber-type doctor blade method

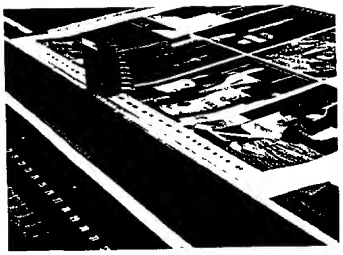


Transferters for smear-free sheet guiding



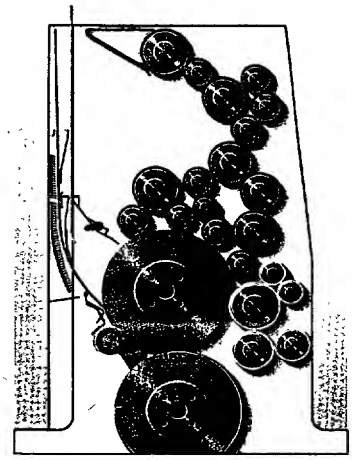


Register control with video magnifier



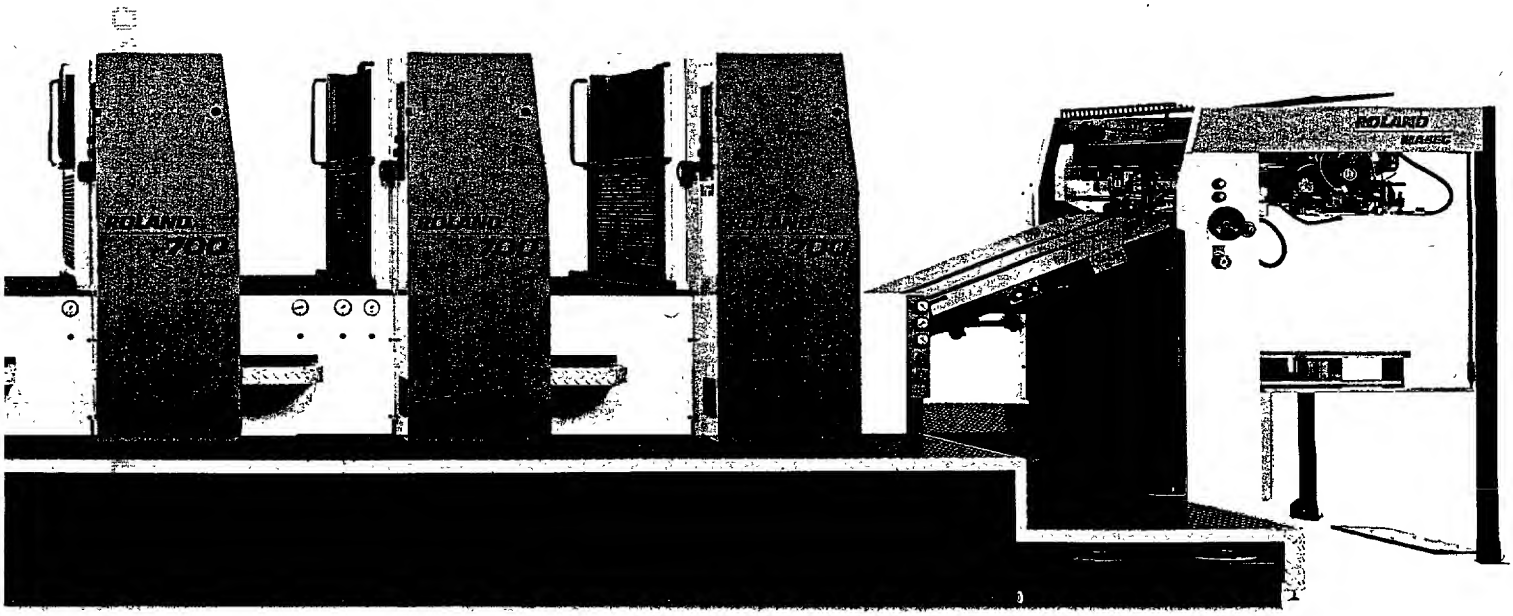
Roland CCI inking regulation

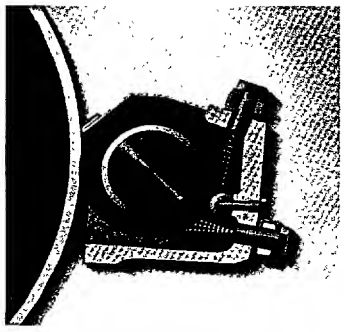
Precise ink and fountain solution feed



Automated or fully-automated plate changing

Suction feedboard for markless sheet feeding





Automatic washing systems for inking units, blankets and impression cylinders

Single-cylinder perfecting system with changeover from the PECOM Press Center

Control console operation – guidance and simplicity

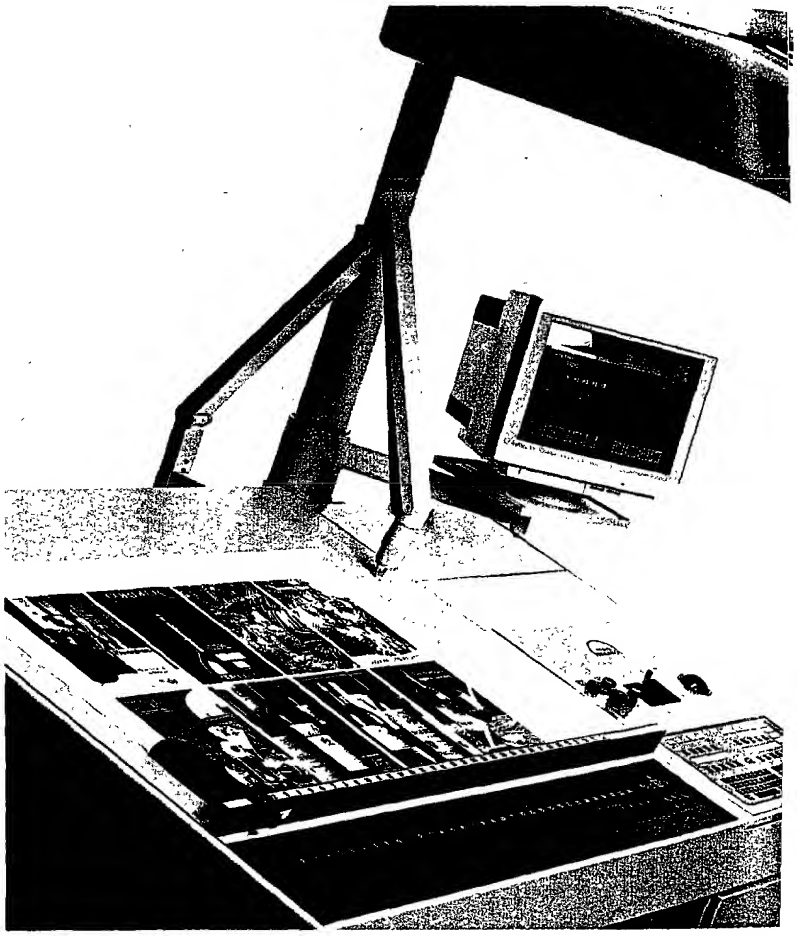
Operation of the Roland 700 from a central control console – the PECOM Press Center – provides two very important advantages: access to stored data reduces makeready times; centralized monitoring of all press functions increases production reliability. Higher productivity and the highest quality have a very positive effect on your profitability.

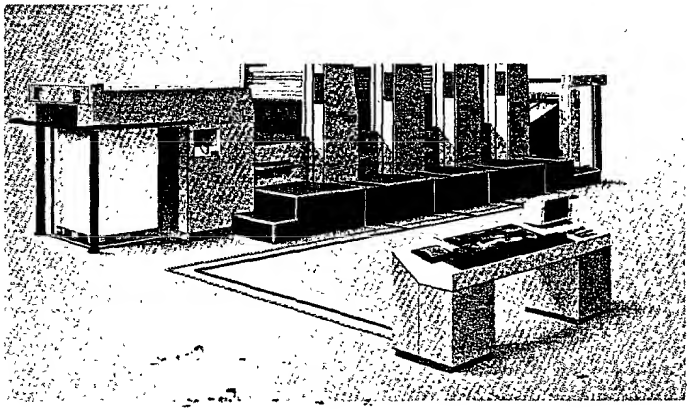
The PECOM Press Center – clear information, fast response

Providing the printer with a clear overview of all press functions has a positive effect on the printed result. Instead of a variety of small displays, all the information that he needs is contained in one video monitor. This allows him to focus his attention on the essentials and thus increases operational reliability. Data exchange between the PECOM Press Center and the press itself is by means of fibre optics – extremely fast and interference-free.

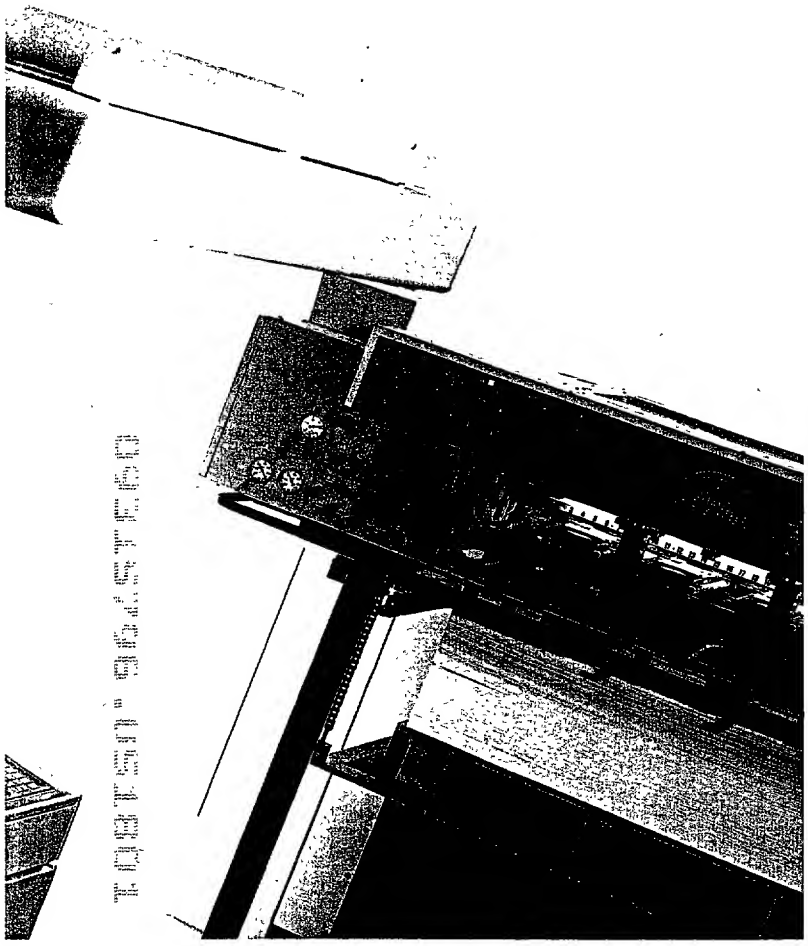
Access to stored data increases capacity

Data for up to 5,000 jobs can be stored in the PECOM Press Center, reducing makeready times for repeat jobs to an absolute minimum. Also new jobs can be quickly prepared by calling up data from similar jobs and making minor modifications. All this can be done while the press is printing. These advantages alone can add up to a time saving of 36 hours per annum. This increases your capacity by seven shifts every year.

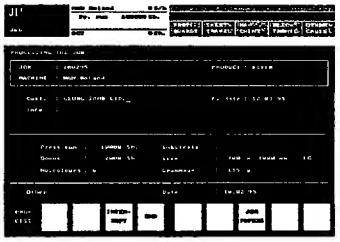


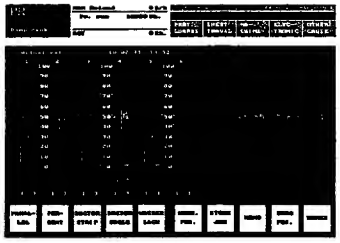


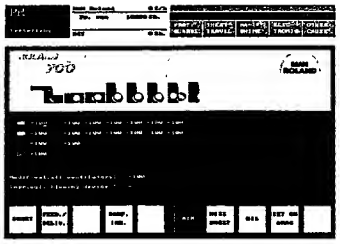
Fast and interference-free: data transfer via fibre optics



A clear overview of all functions from the monitor







Full control also of peripheral items

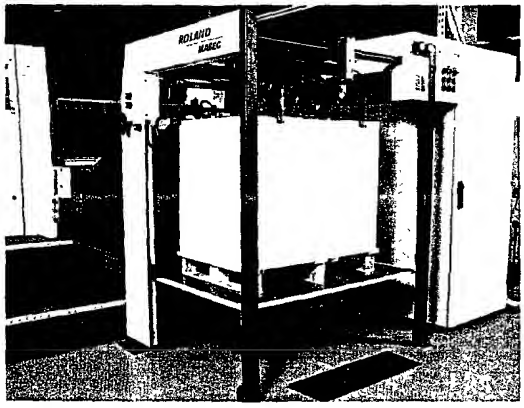
Powder sprayer, dampening solution conditioning and almost all other peripheral items can be controlled from the PECOM Press Center. Correct operation is automatically monitored. A diagnostic system reports in clear text form on operating conditions. If for example a guard is inadvertently left open, a message is displayed on the monitor.

Fast control through clearly arranged functions

The visual arrangement of the function control programs corresponds to the requirements of the pressroom. No endless searching through complicated menus but instead clear and easy to follow sequences accessed and implemented via a user-friendly foil keyboard. Logically structured applications modules group together all related activities such as inking control and regulation or register, thus providing fast access.

A well-developed sheet guiding system for high production reliability

It would be ideal if the sheet could be transported through a printing press from feeder to delivery without any sheet guiding contact points. This is not yet possible but MAN Roland's design engineers have come close with the development of a sheet transport system that ensures that the freshly-printed surface is not disturbed. The Transferters and air tracks used on the Roland 700 provide markless sheet transport. With the automatic sheet size setting, the press is quickly and easily changed over to another sheet size and thickness.

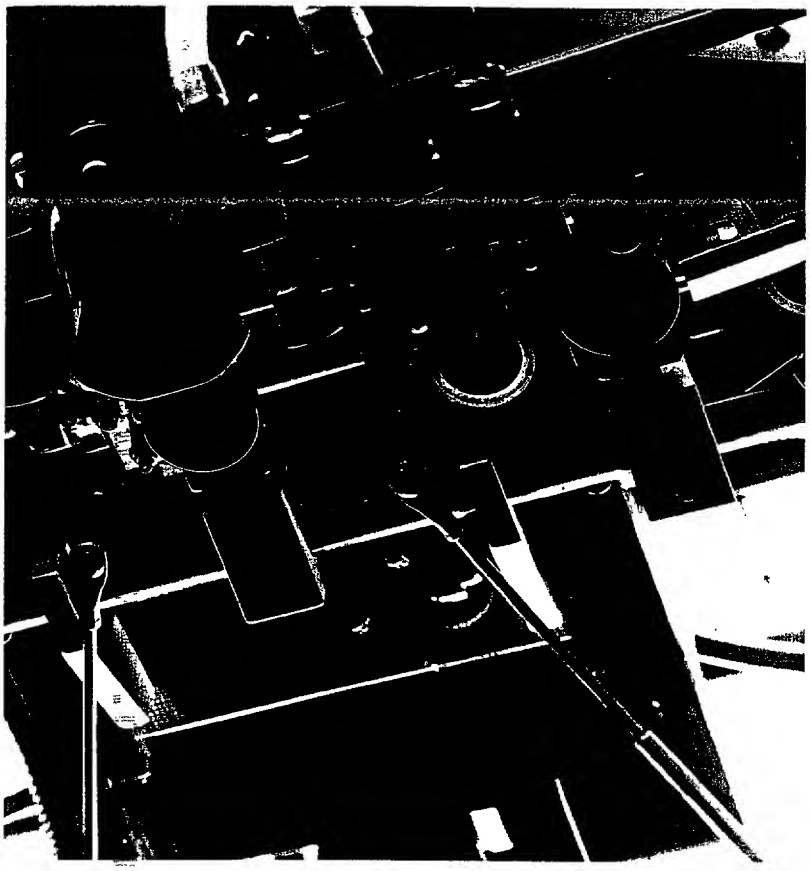


The feeder: automatic sheet size setting for short makereadies; suction feedboard for markless sheet transport

It starts with the suction feedboard where there are no rolls or brushes that could mark sheets already printed one side or sensitive stocks. Pneumatic sidelays ensure markless alignment. Between units, the Transferters transport the sheet without touching the printed surface. Air tracks support the sheet during travel. In the delivery area, blast air and suction rollers brake the sheet and ensure safe and even piling even at the highest speed.

Fast sheet size changeover

The following example shows how quickly you can set up your Roland 700 for a new sheet size: with automated plate changing and the same colour sequence, a five-colour press set up for 150 gsm art board 610 x 860 mm can be changed over to 80 gsm uncoated paper 700 x 1000 mm in only ten minutes. All necessary settings are automatically carried out as other changeover steps are attended to. All the printer needs to do is input the new sheet size and thickness and up to 14 setting operations such as repositioning of the suction head and the sheet stops in feeder and de very take place as almost unnot ced background operat ons And even this input is unnecessary if the job has been prepared at a TPP station or s ava ab e from the repeat job database



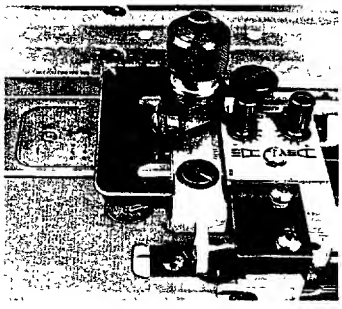
Sheet monitoring for reliable production

Because every sheet is monitored right through the press, the probability of errors is reduced to a minimum. This assures you of consistent quality and avoids interruptions to production. Double sheets are detected and stopped before they enter the press. An additional electronic double sheet detector is provided for especially thin stocks.

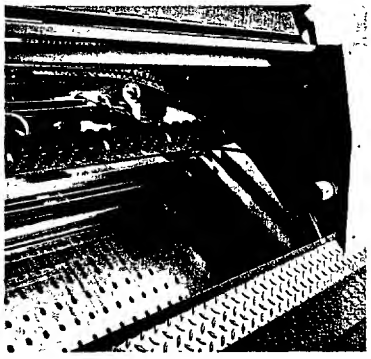
Misaligned sheets are recognized early and deviations from the optimal infeed line are visually indicated in a trend display. This allows the printer to intervene and correct sheet alignment before this leads to a feeder stop.

Printing also from a reel with the RB 70 sheeter

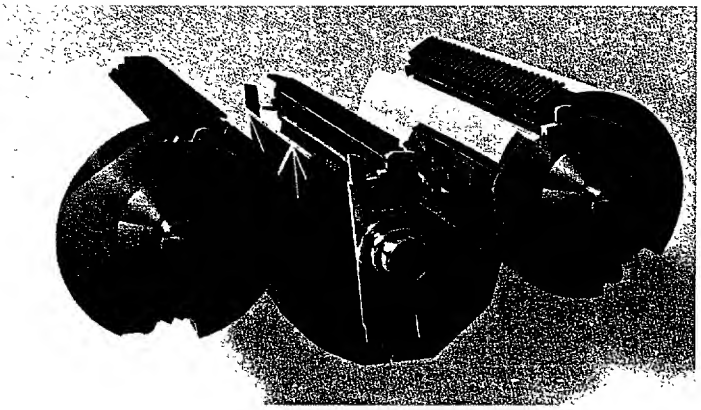
An optional item for the Roland 700 that is especially effective for many applications and can broaden your range of services is the RB 70 reel sheeter. This gives you access to certain stocks that are only available in reel form. And some stocks, such as very thin foils, can be easily fed from a reel but are very difficult to handle in sheet form. There is also the cost factor: many stocks are considerably cheaper in reel form.



Exact sheet alignment by pneumatic sidelays



Secure sheet guiding by air tracks



The Transferter: smear-free sheet transfer

Plate changing – unmatched for speed and productivity

The shorter the run lengths, the more important short makeready times become. When you can dramatically reduce the time normally needed for plate changing by using automated plate changing on the Roland 700, even with the typically wide range of jobs that a general commercial printer has to handle, you achieve continuous production and that means high productivity. It also means that your press is amortized sooner.

The more often you have to change your Roland 700 over for a new job, the more beneficial is the automation provided by PPL (Power Plate Loading) or the full automation provided by APL (Automatic Plate Loading). These systems save a very considerable amount of time with every job change.

PPL brings higher capacity with fewer waste sheets

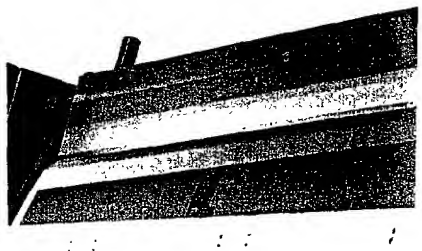
The major benefits of PPL are increased capacity and reduction of waste sheets. The register accuracy is so high that with 95% of jobs no correction is needed after plate mounting. PPL offers even further advantages: the printer can change plates without opening the guards. As the used plate is guided automatically into the exit chute, from where it can be removed at any convenient time, the operator places the new plate in the loading chute. An electronic monitoring device in the register pins checks that the plate is precisely positioned in the front plate clamp.

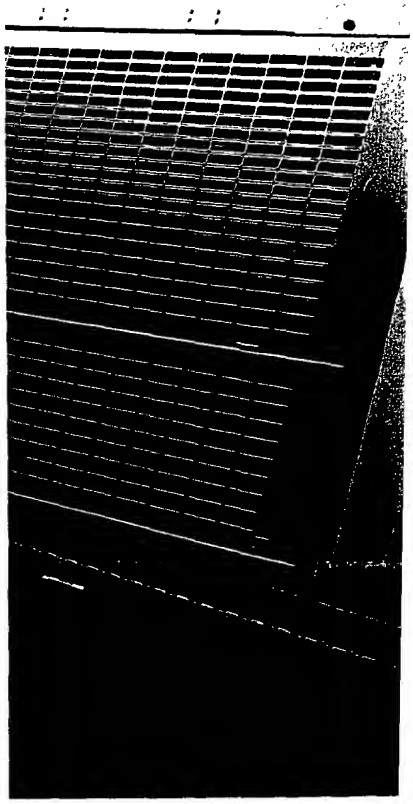
APL to further standardize operations

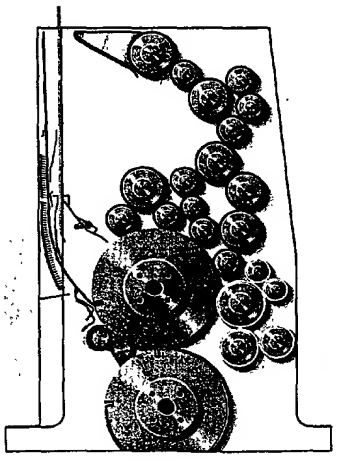
The fully-automated APL function makes operation even more simple, changing all plates without any manual intervention. The plates are loaded quickly and precisely every time. This excludes any possibility of human error and provides you with fully standardized operating conditions.

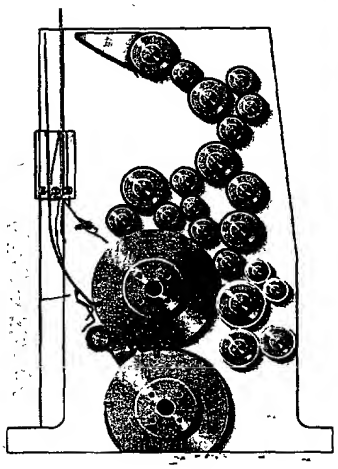
Plate compatibility

Another point: PPL and APL can handle new plates with straight edges as well as previously-used plates. Both systems offer plate compatibility with other presses in this sheet size category – MAN Roland as well as presses from other significant manufacturers – either as standard or available on request.

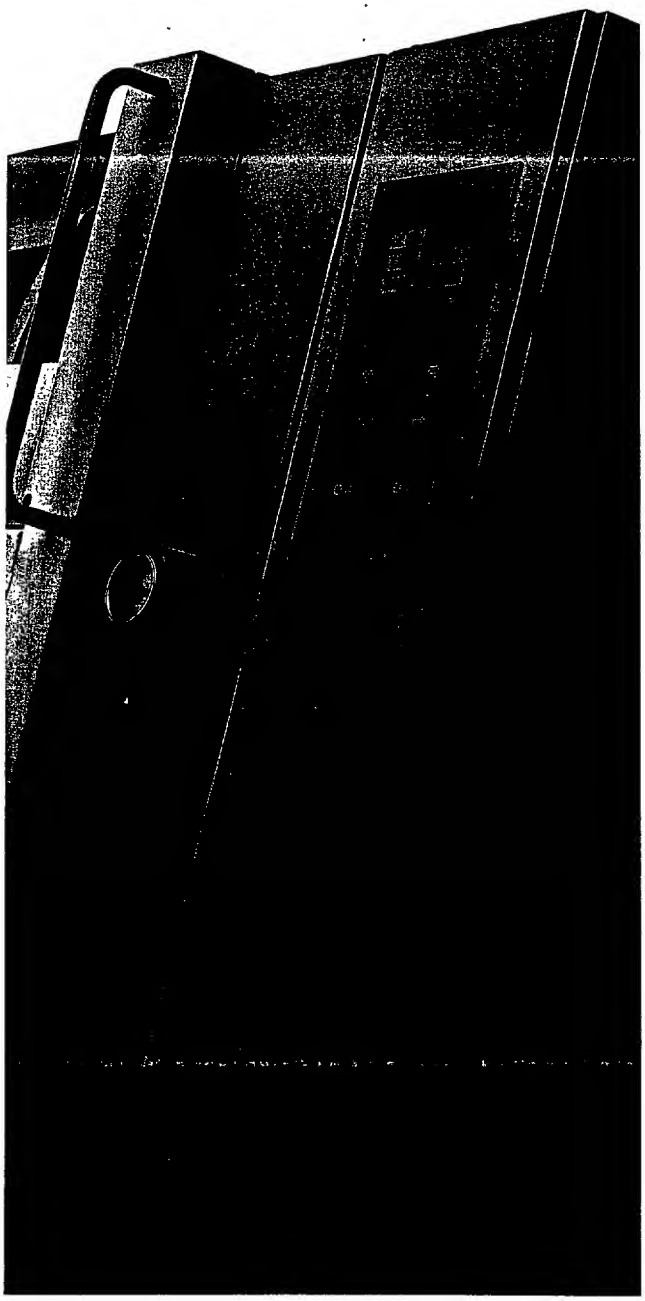


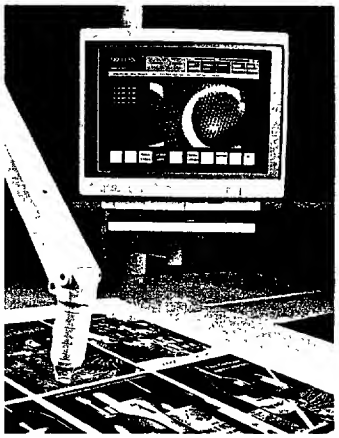




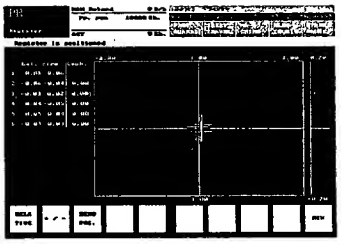


PPL automatic plate changing (left), APL fully-automatic plate changing (right)





Automated register control with the video magnifier



Register adjustments – remote controlled or even fully automated

Adjustments to lateral, circumferential and diagonal register are made from the PECOM Press Center. Changes to diagonal register do not affect printing unit settings because the adjustment takes place in the Transferter. It is therefore not necessary to reset the position of the forme inking rollers – a further contribution to reduced waste sheets and consistent print quality. With the RQM (Register and Quality Magnifier) you can also make register corrections in very difficult subjects by remote control. Very fine picture elements such as reverse lines can be used as reference points for regulation. And you can examine results by displaying the picture element on the Press Center monitor enlarged 50 times. Automatic regulation of register on the run is also possible by means of a measuring system using cameras mounted in the last printing unit and special register crosses. The printer inputs the postion of the crosses and these are automatically tracked by the cameras.

Print length adjustments fast and easy

The special slide bearings used for the plate and blanket cylinders permit printing with or without bearer contact. This enables print length adjustments to be made quickly and easily.

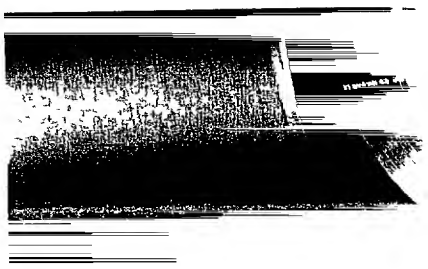
Quickstart saves start-up waste

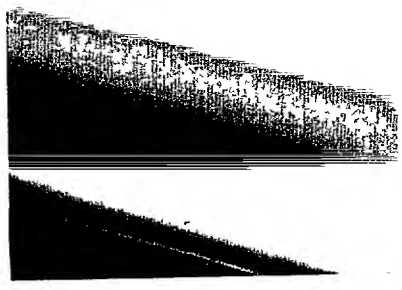
Quickstart is the name of the new system developed for the Roland 700. The press accelerates up to full production speed before the first sheet is printed. Tests on a six-colour Roland 700 showed that start-up waste can be reduced by 50 %.

New inking and dampening units for the highest print quality

You know the problems: unstable ink feed, ghosting, uneven ink coverage, hickeys – resulting in expensive waste sheets. The Roland 700 shows that there is an alternative to this. It is precisely with difficult formes that the new inking and dampening units show what they are capable of. Superior printing press technology for trouble-free inking of the highest quality.

Inking and dampening units with many extras





The special roller geometry used on the Roland 700 is the key: fast reaction to adjustments and very stable ink feed ensure consistently high-quality printing.

Automatic inking-up

At the start of a new job, all inking units are inked-up with exactly the amount of ink that is required for the job. This represents controlled and carefully measured use of materials from the very beginning.

Inking unit separation reduces waste sheets

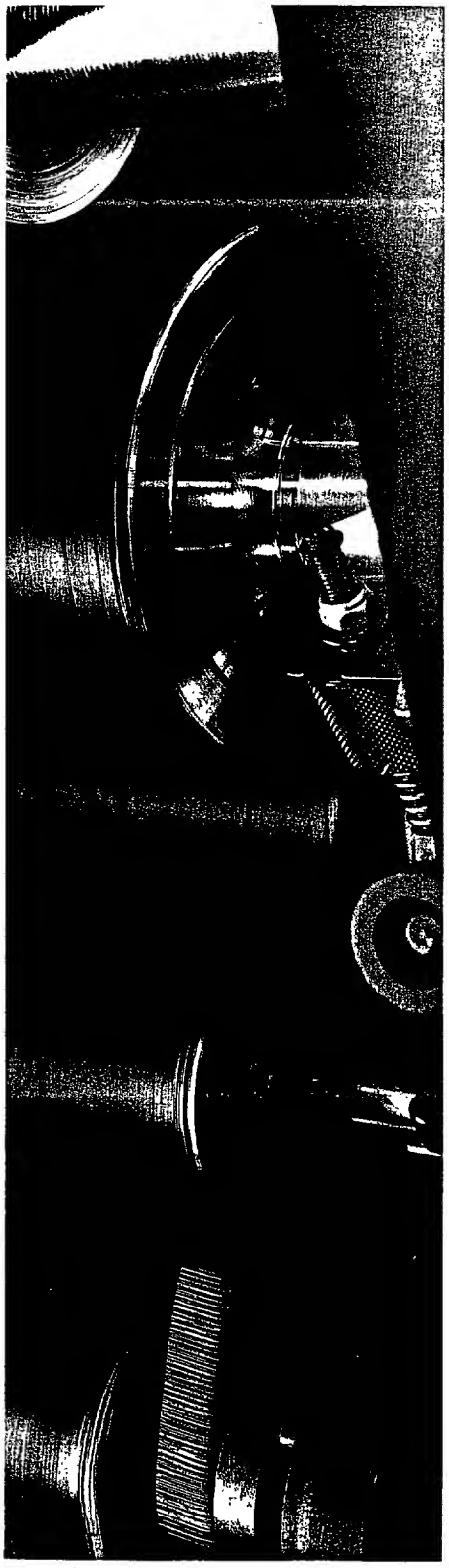
When printing is interrupted, automatic inking unit separation preserves the inking profile in the roller train. When printing starts again, production quality inking is achieved faster and that means fewer waste sheets.

To avoid ghosting...

...steplessly adjustable oscil a-tion of all forme inking rollers can be set from outside the press during production.

And ink fade...

...can be prevented by adjusting the stroke of the ink osc - lators in 30° increments from the PECOM Press Center wh e the press is running.



Constant printing conditions for production security

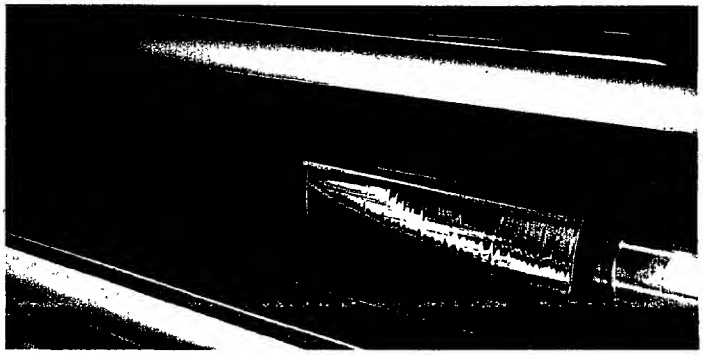
Inking unit temperature control on the Roland 700 provides constant printing conditions that save you time and bring greater security to your production. It also provides ideal conditions for waterless offset printing, expanding the range of services you can offer.

The Roland Deltamatic dampener eliminates hickeys

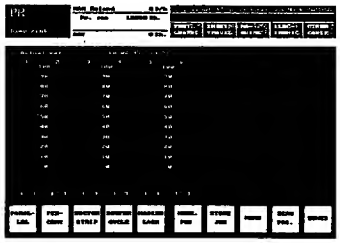
The Delta effect removes hickeys from the plate without waste sheets and interruptions to production. The number of sheets saved is very significant, as the following example shows: a four-colour Roland 700 in two shift operation that prints 1500 jobs per year, with an average run length of 15,000, can save between 29,000 and 30,000 sheets. Every year.

Controlled fountain solution conditioning increases print quality

From the PECOM Press Center of the Roland 700 you can permanently control and regulate fountain solution consumption as well as the alcohol level, thus ensuring constant printing conditions. The dampening unit is provided with automatic compensation to make certain that the correct amount of solution is fed according to press speed. You can also use the diagonal setting facility for the metering roller to control the solution feed within the subject. This all contributes to printed results that satisfy the highest demands.



Roland Deltamatic dampener: removes hickeys without manual intervention



Highest quality with even the most delicate colour shades

Delicate colour shades in the subject demand special skills from the printer. With Roland RCI and Roland CCI you can achieve very fine colour matching precisely and quickly. The presetting data needed for this is available to you within seconds either online or from a data carrier. And here is our secret recipe for formes with very low image coverage: LCS – Low Coverage Stabilisation – permits a constant ink feed even with formes that have very fine image elements that require the minimum of inking.

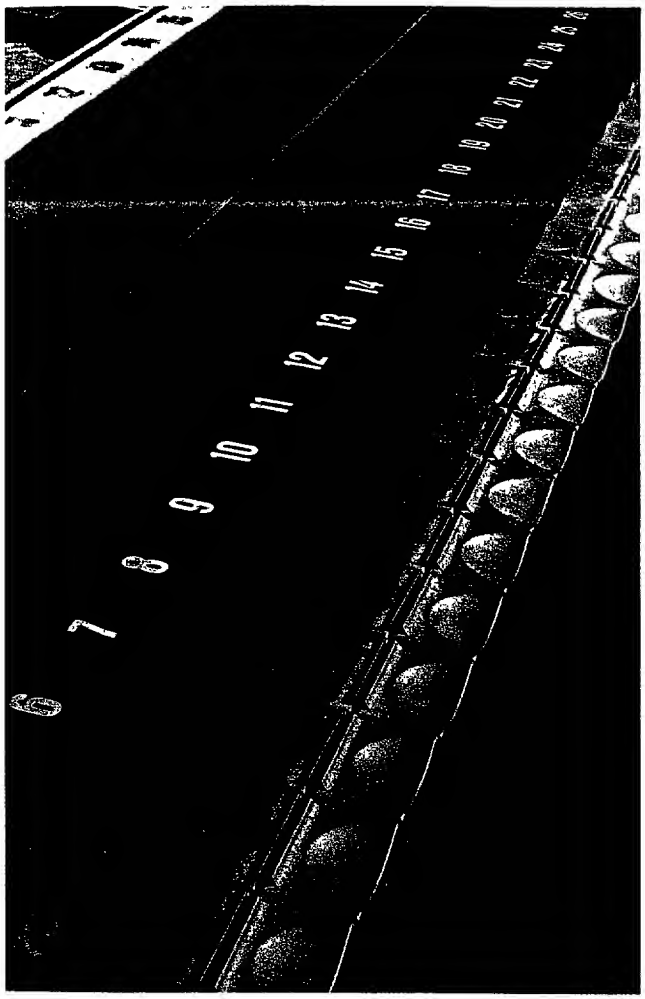
A unique new development: excellent results with low coverage formes

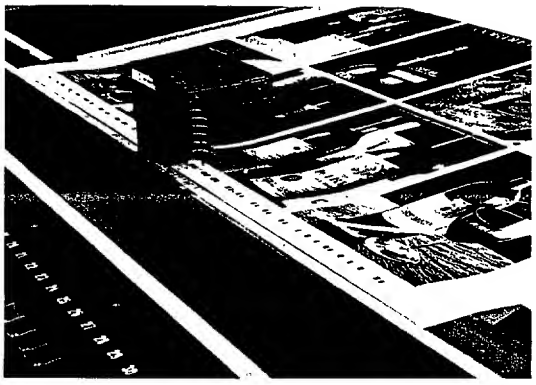
A real-life example: a five-colour job with the fifth colour a special forme of only a few fine lines in a specific house colour that must be very precisely reproduced. However, such jobs have always presented problems because the low ink consumption of the special colour plate made consistent inking extremely difficult. Not any more – MAN Roland has solved this problem with Low Coverage Stabilisation. An automated system that opens only every second ink slide a defined distance and uses maximum ink vibrator stripe causes the ink to circulate back from the inking unit to the ink fountain. This prevents ink build-up or emulsification on the rollers. It also reacts extremely quickly to ink feed changes. The bottom line: the Roland 700 with LCS offers you high-quality printed results also with formes containing extremely fine images.

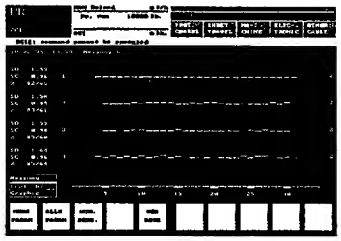
Roland CCI inking regulation system

Inking control with RCI

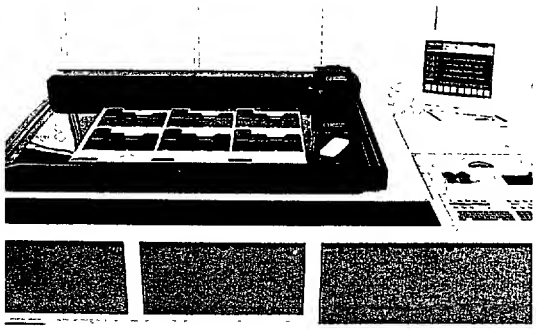
The Roland RC nk ng contro system is integrated n the PECOM Press Center and dramatically shortens makeready times. The PECOM Pre-press Interface provides you w th presetting data d rect y from the pre-press area or from the electronic plate scanner W th repeat jobs, the pr nter has access to all necessary data from the internal job database n the PECOM Press Center D g ta transfer of data from the console to the press perm ts the







Exact and fast: automatic inking regulation with Roland CCI



Multi CCI 2D: ink density measurement in any position in the forme

ink slides on all printing units to be set simultaneously. The presetting values are so exact that the printer ony needs to make very minor corrections, if any, and the press comes into colour in a matter of minutes with the minimum of waste sheets.

CCI for automatic inking regulation

Roland CCI automatically measures and regulates ink densities in solid and screen areas. An extremely precise and fast-reacting densitometer detects every colour fluctuation and regulates even the most minute deviations that even the practised eye of the printer cannot recognize. The results are recorded to provide a quality analysis over the entire run. Demanding customers can be provided with this verification of consistent high-quality production.

Roland CCI thus ensures consistently high inking quality over the entire run and also reduces makeready times. What this means to you is consistent and verifiable quality as well as increased productivity. Multi CCI is a system variant that uses one measuring and regulating station to serve several presses – a very cost-effective alternative.

Multi CCI 2D saves expensive material

Especially in packaging and special applications printing, the substrates used are often expensive. You can reduce costs by optimal utilization of the full sheet. Multi CCI 2D permits you to locate measurement areas anywhere on the sheet or even measure from single-colour solids directly in the forme. Multi CCI 2D measures contact-free and thus considerably reduces waste of expensive materials.

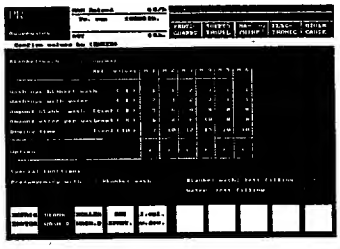
Fast, thorough and environment-compatible washing

Environment protection and economical operation – the Roland 700's automatic washing systems unite these ideals. The new brush-type washing device for blankets and impression cylinders use a very low amount of washing solution and still wash quickly and thoroughly. A recycling device enables you to clean and re-use washing solutions containing solvents. It is of course also possible to use vegetable oil-based solutions and this is an especially environment-compatible method.

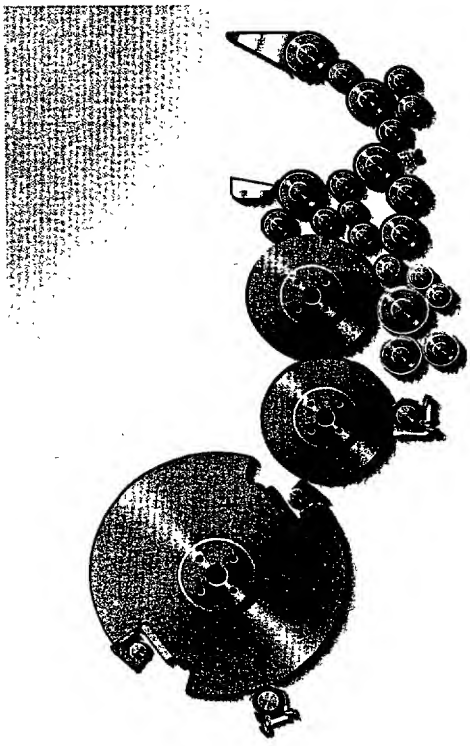
The new brush-type washing device used on the Roland 700 consumes less than 0.1 litre of washing solution per printing unit per washing cycle. Inking rollers, blankets and impression cylinders are cleaned quickly and thoroughly. Spray mist formation is minimal, thus allowing vegetable oil-based solutions to be used.

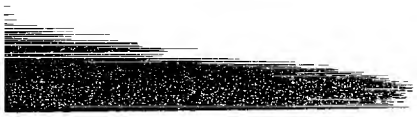
Comfortable washing of the inking units

You can activate inking unit wash-up centrally from the PECOM Press Center. You can also define programs for different washing requirements and simply call them up when you need them.

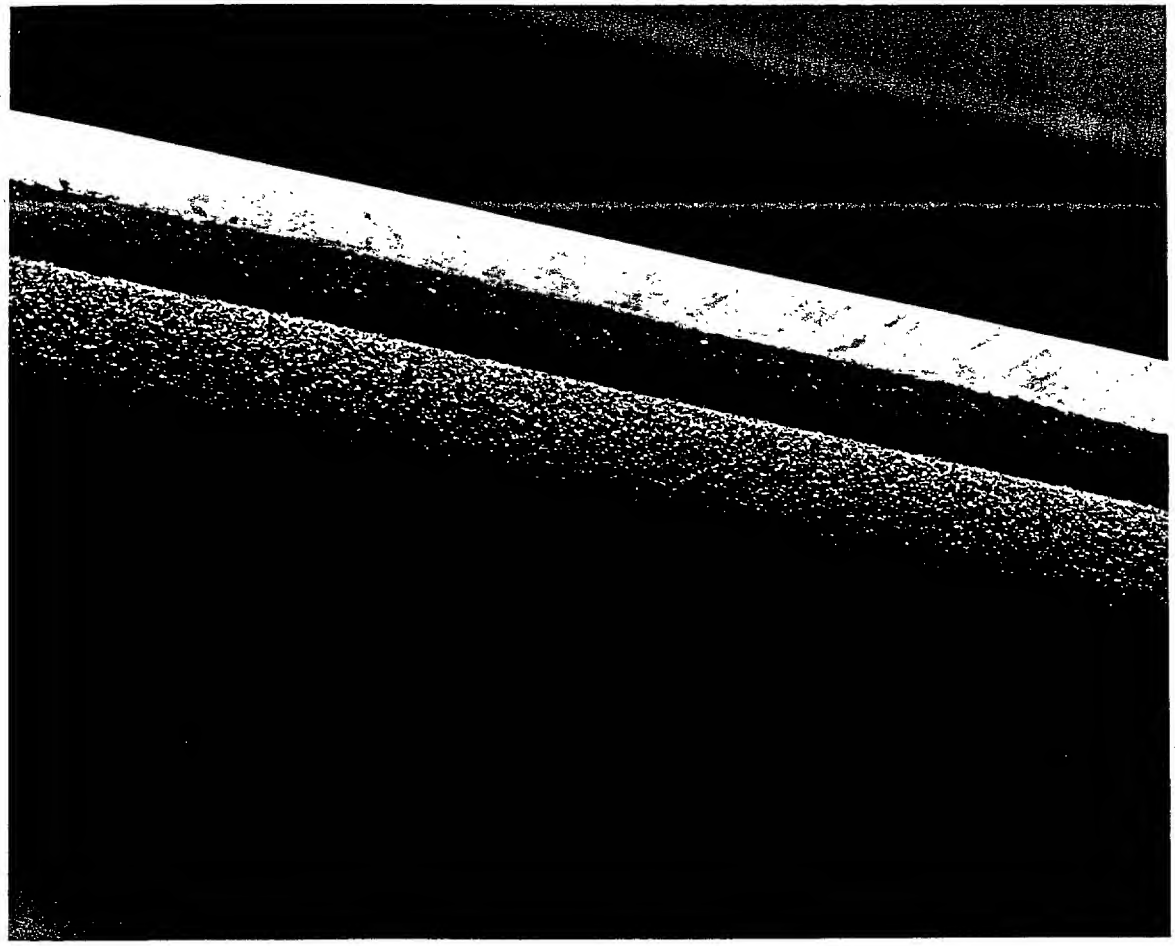


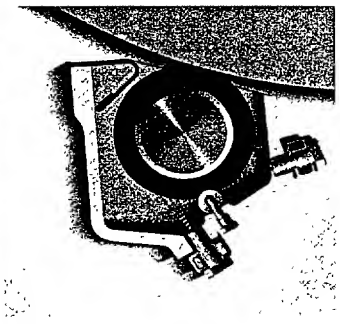
Defined washing solution dosage, centrally controlled from the PECOM Press Center



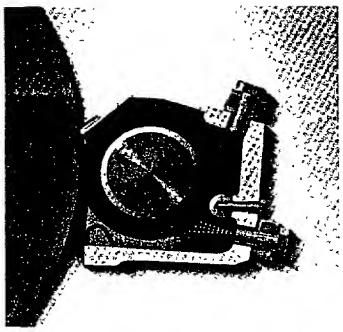


Automatic wash ng systems for inking un ts b ankets and impression cyl nders





Automatic impression cylinder washing device



Automatic blanket washing device

Blankets and impression cylinders cleaned within minutes

The bad old days: what used to be a tiresome and time-consuming task is today accomplished in less than two minutes with the automatic blanket and impression cylinder washing device on the Roland 700.

Exact dosage depending on the degree of soiling means that you also use less washing solution and this is good for the environment.

The washing programs can be simply defined and activated from the PECOM Press Center.

Recycling is better than disposal

For example, the washing brushes have a useful life of several years. When they are worn, the core can be fitted with a new brush covering.

Used washing solution containing solvents can be recycled in a solvent recovery unit. This unit has been tested and approved by the German Employers' Liability Insurance Association. Up to 68 litres of solvent can be recovered within 12 hours. Alone through eliminating the costs for new solvent and the costs for disposal of the used solvent, the unit can be amortized in around one year.

Quality and economy with inline enhancement

Whether you need to produce the finest of gold lines, a royal coat of arms or a high-gloss protective layer – the demands made on coating are extremely high. Growing sophistication in product enhancement requires new and innovative methods. The Roland 700 coating modules are setting new standards in all areas of print enhancement.

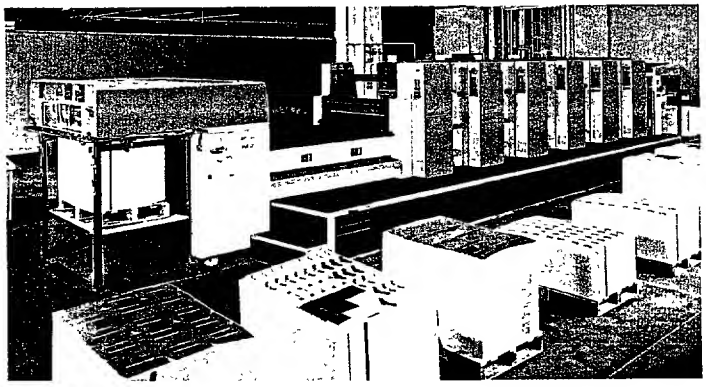
The technical advancement of the Roland 700 coating modules has opened up a new dimension in the quality of print enhancement. The brilliant results speak for themselves. But the Roland 700 is also setting new standards of economy: equipped with two coating modules, it can perform two enhancement operations in one sheet pass.

All manner of coatings

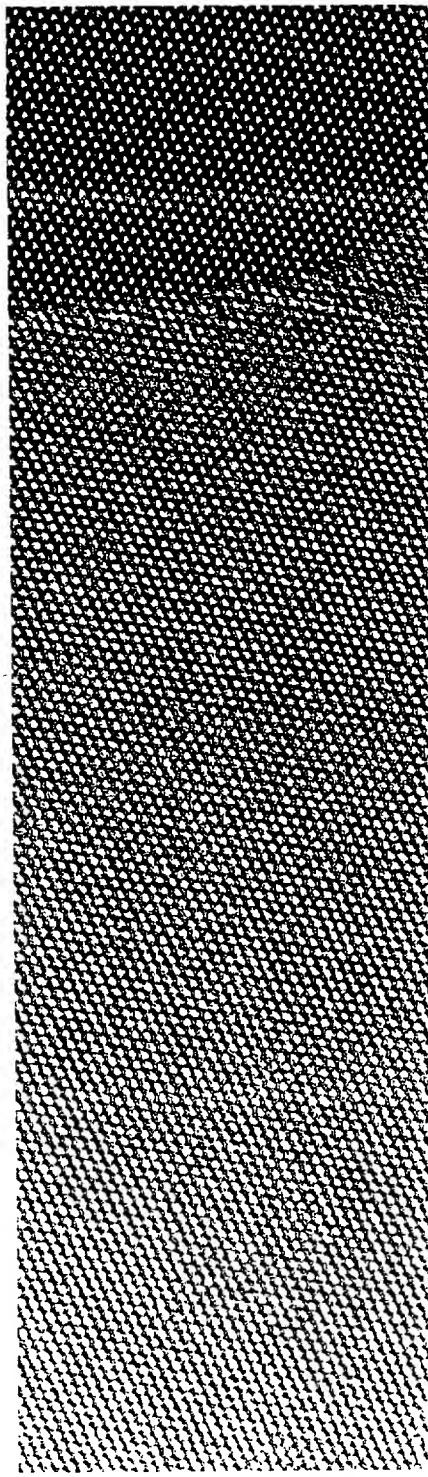
Gold or silver aqueous inks, UV or aqueous coatings – there is no restriction on the type of inks or coatings that can be used. The Roland 700 can process them all with the same high degree of precision on all substrates.

Precise metering saves money

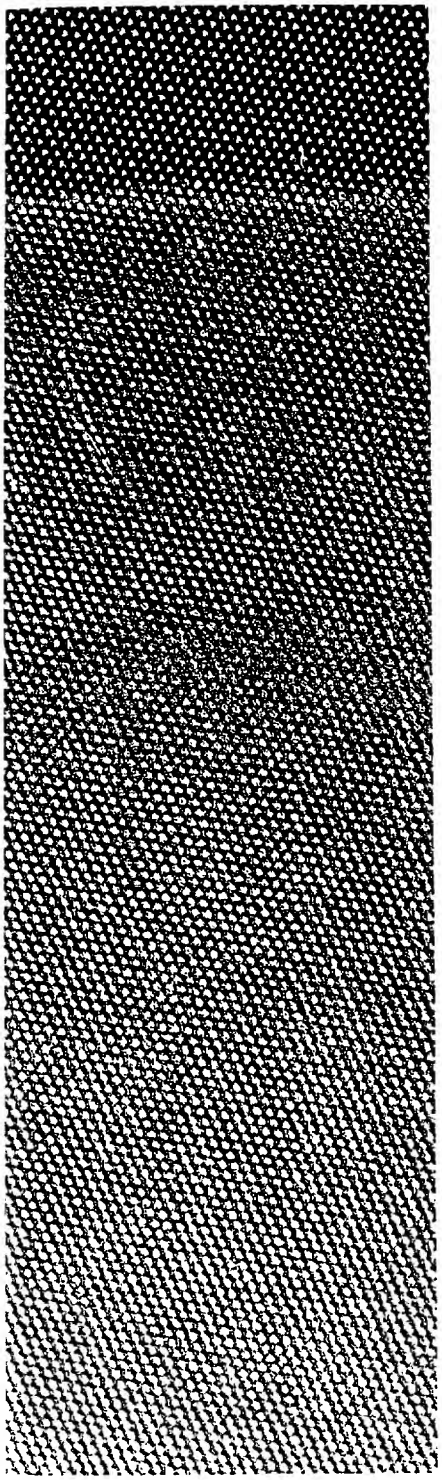
Precise metering of the coating is not only important for the quality of the result, it is also important from the cost aspect. The Roland 700 offers a choice of two methods that both ensure precise metering. The two-roller method provides fast reaction to changes in the amount of coating applied. The other method uses a chamber-type doctor blade and is suitable for a wide range of applications, but is especially effective with fine golds and silvers with low coverage. A laser-engraved, ceramic-coated anilox roller together with a chamber-type doctor blade meters the coating extremely precisely over the full width of the sheet. This method is not affected by viscosity fluctuations, nor is it affected by changes in press speed.



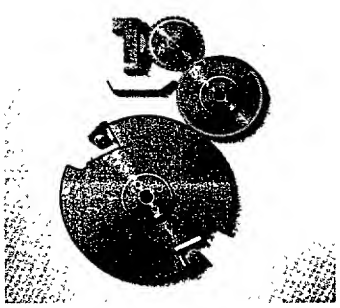
Five-colour Roland 700 with coating module and extended delivery

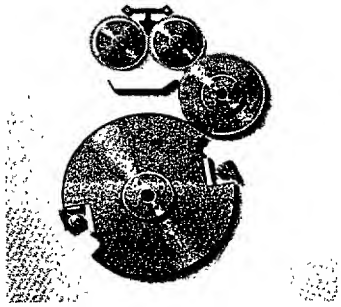


Magnified 6X: the surface of the anilox roller



A choice of metering methods for coating: with chamber-type doctor blade and anilox roller (left) or with a two-roller system (right)



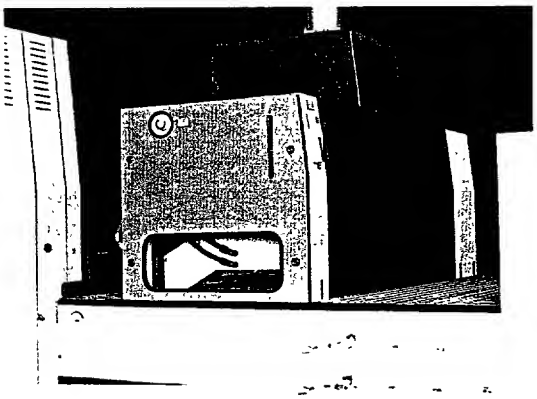


Metering systems changed fast

The requirements of the job currently being run determines which system you use. These requirements vary constantly in a modern printing plant, making fast changeover from one method to the other essential. The Roland 700 coating modules have good accessibility and can be changed over quickly and easily.

Fast and reliable drying

The Roland Seccomatic drying systems have proven their worth in hundreds of Roland 700 installations, providing fast and reliable drying. Partitioning of the drying area from the rest of the delivery provides ideal drying conditions. This limits the spread of humid air and this relatively small volume is extracted in order to support the drying process. To meet all requirements, the Roland 700 can be equipped with IR, IR/hot air and also UV intermediate and end of press dryers.

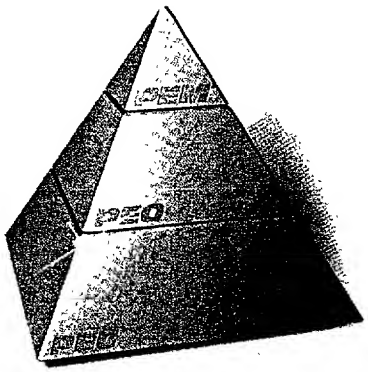


Roland Seccomatic:
IR and hot air intermediate drying

The highest performance and cost clarity in a data network

Digital data technology has also set new standards in print production. This is because a printing press integrated in a data network can produce at a level that a conventional press cannot approach. The Roland 700 is the central component in the PECOM process electronics concept – a system that enables data to be communicated over many areas and levels of production in order to increase output, provide clear cost information and avoid multiple handling.

MAN Roland's PECOM process electronics system provides you with the means to efficiently structure data handling in your plant and make it available to each individual production cell. The base level is called Process Electronic Control and encompasses the production unit, i.e. the press, with all its functions. This level is linked to the middle level - Process Electronic Organisation - that covers organisation for and in the machine room such as plate scanning and also technical order preparation at the TPP station. The top level – Process Electronic Management – is the interface to the administrative area. This is a standardized, open interface that enables management to use appropriate industry software to evaluate information on print production.

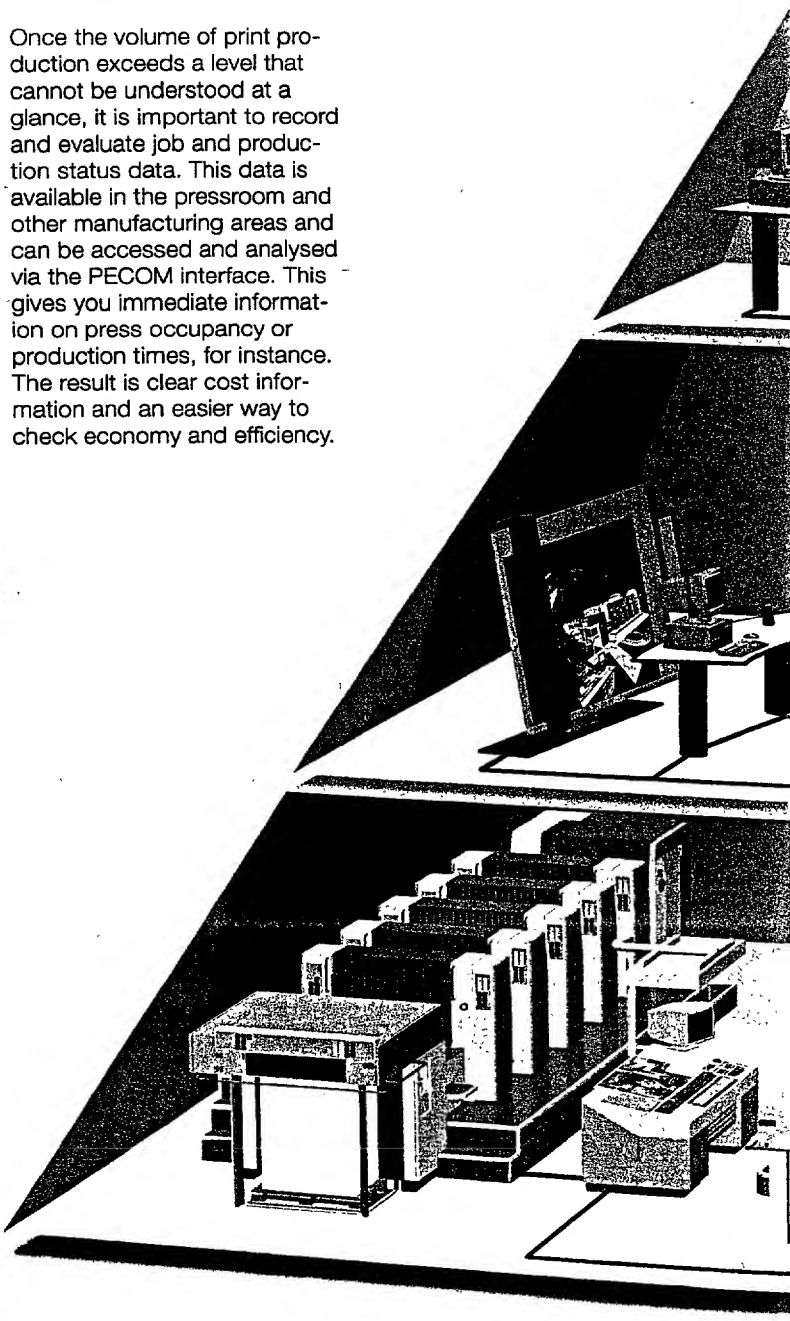


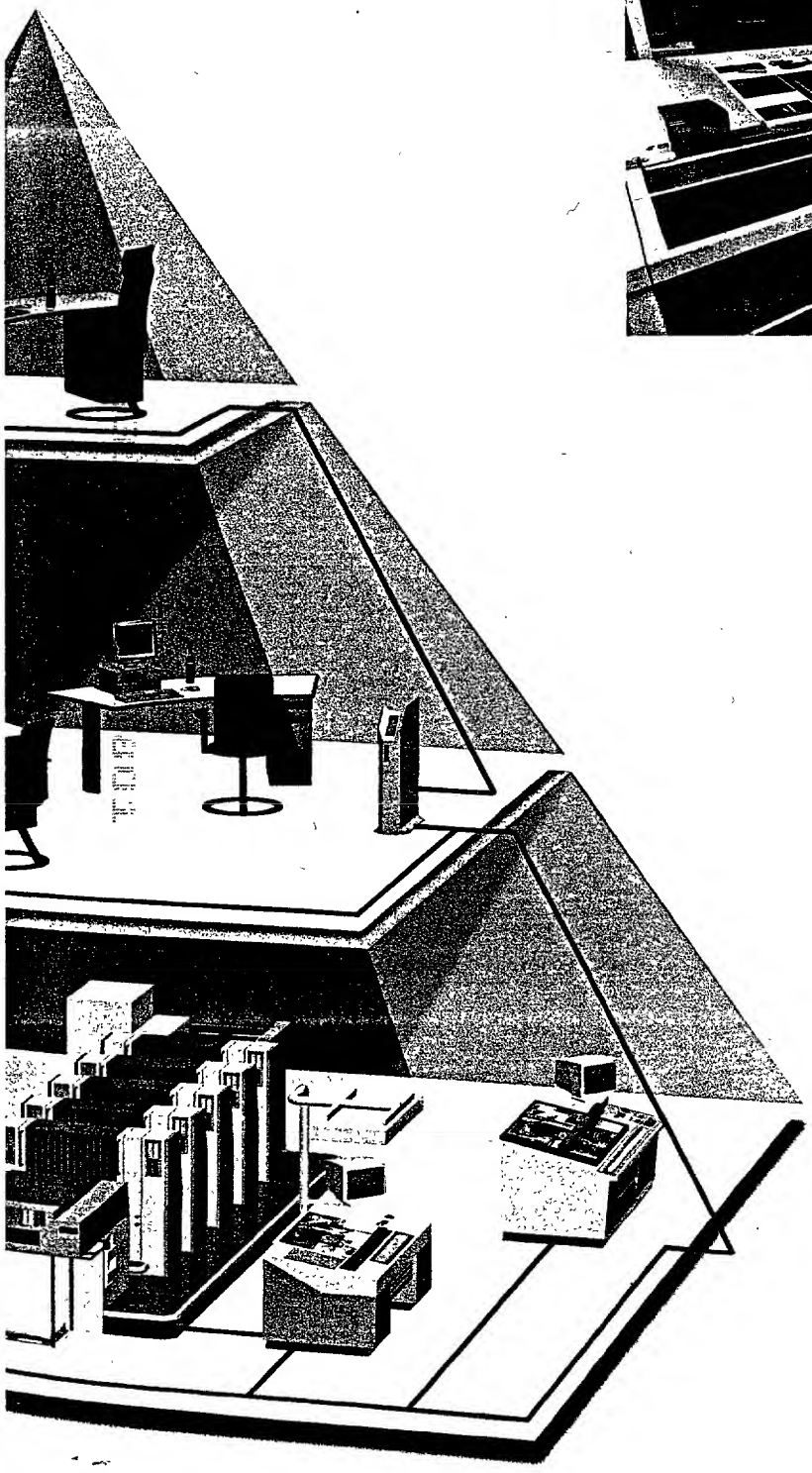
Communication supports standardized production

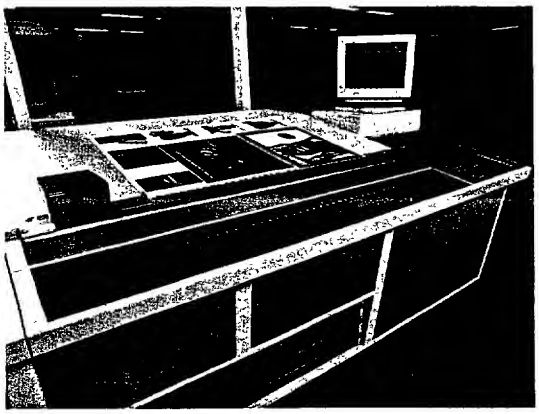
Data needs to be generated and recorded only once and is then available for use at all levels. This not only saves double handling but is also a prerequisite for standardizing the procedures in your manufacturing, an essential step for all companies wishing to achieve industrial-scale production. And standardization is a must for DIN/ISO 9000 accreditation.

Knowing where you stand

Once the volume of print production exceeds a level that cannot be understood at a glance, it is important to record and evaluate job and production status data. This data is available in the pressroom and other manufacturing areas and can be accessed and analysed via the PECOM interface. This gives you immediate information on press occupancy or production times, for instance. The result is clear cost information and an easier way to check economy and efficiency.







PEC level:
central press operation
from the PECOM Press Center

PEO level:
central job preparation
at the TPP station

Reduce makeready time with the TPP station

The TPP station enables you to carry out printing press-specific job preparation for several console-equipped presses from one central location. The TPP station provides electronic „job envelopes" that contain all necessary information for the job concerned, including presetting data. The database of the TPP station provides central storage of up to 5,000 jobs that can be called up within seconds. Data feedback from the press to the TPP station makes it possible to check the actual production stage of a job at any given time.

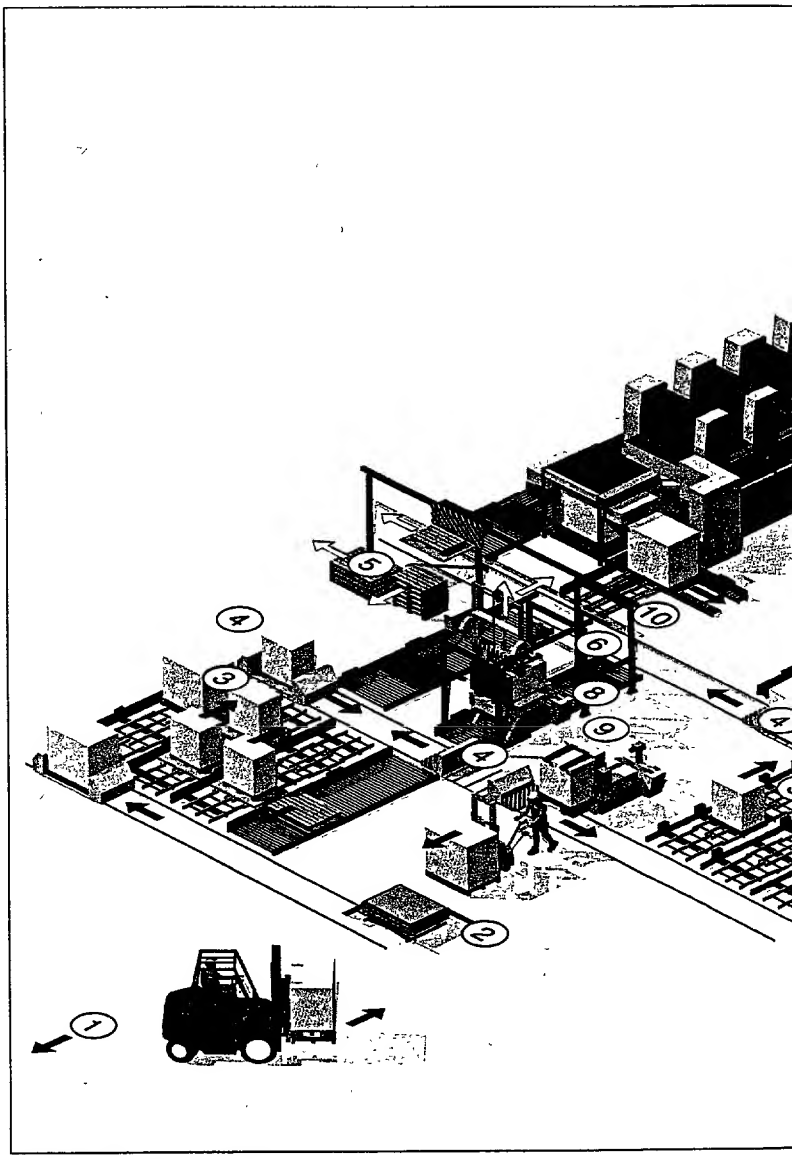
Materials handling logistics and uninterrupted production

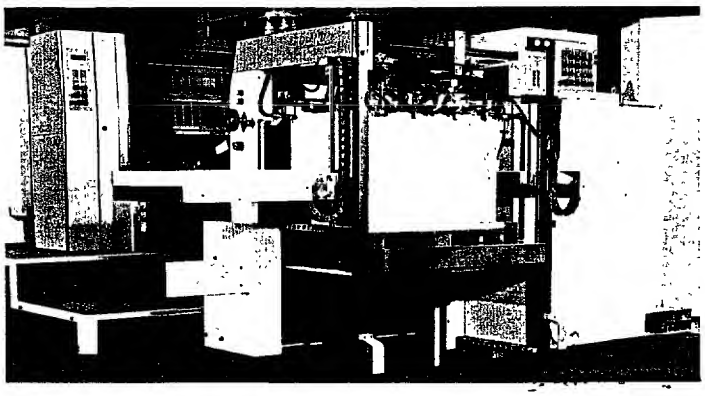
Interruptions to production – manual pile changes for instance – have a very negative effect on your production results. The non-stop systems available for the Roland 700 ensure continuous production, even at top speed. The AUPASYS fully-automated pallet transport system opens up a new dimension in productivity: industrial-scale materials handling logistics.

In many printing plants today, printed and unprinted piles are still being moved around in a very labour-intensive manner. The means are available to greatly improve efficiency in materials handling – AUPASYS, the materials handling and logistics system from MAN Roland. Depending on the space available in the plant, we can offer AUPASYS as a twostage, expandable system: Stage 1 provides fully automated pile changing for the feeder and a new intermediate piling device for the delivery. Stage 2 provides a complete pallet transport system that connects the printing and finishing areas to the raw materials store and intermediate storage areas.

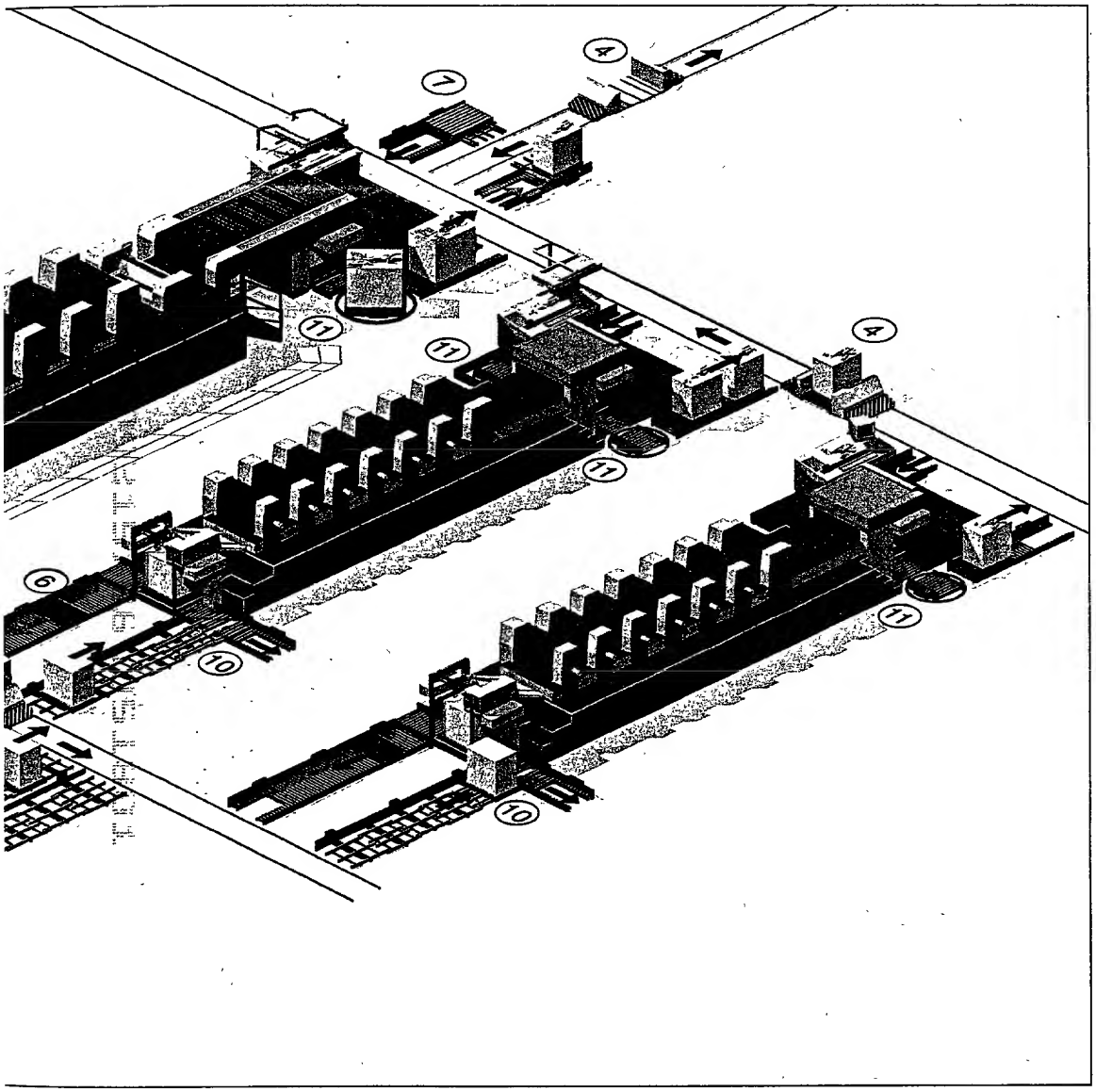
AUPASYS increases productivity even in stage One

The more often piles need to be changed, the more important automated functions become. AUPASYS provides you with fully-automated pile changes – NONSTOP – at full press speed. This speeds up job processing – especially in carton printing. Freed from the hectic activity associated with loading and unloading piles, your operators can concentrate on print quality. This increases productivity in two ways: your production is faster and your reject sheets are fewer.





Non-stop pile changing at the feeder



① Raw materials store
② Hoist station with intermediate plate
③ Storage areas
④ Shuttle Car
⑤ Transport pallet
⑥ System pallet
⑦ Empty pallet
⑧ Pallet changing unit
⑨ Pile turner
⑩ Chain system for roller conveyor corners
⑪ Turning platform

AUPASYS as a complete materials handling system

Stage Two provides complete and automatic material transport within the printing plant for even greater handling efficiency. This system automates material transport from the paper store to the press and from there to the finishing area. Pallets can be accessed according to size and press. Pile turners integrated in the system ensure that the piles are perfectly prepared. The empty pallets are transported back to the pile turners in an automated, closed-loop operation.

Planning and preparation

An AUPASYS installation – especially Stage Two – requires intensive planning. We and our sales and service partner will assist you with a detailed analysis of your specific circumstances and needs and provide you with the necessary guidance to ensure that you receive maximum benefit from your materials logistics system.

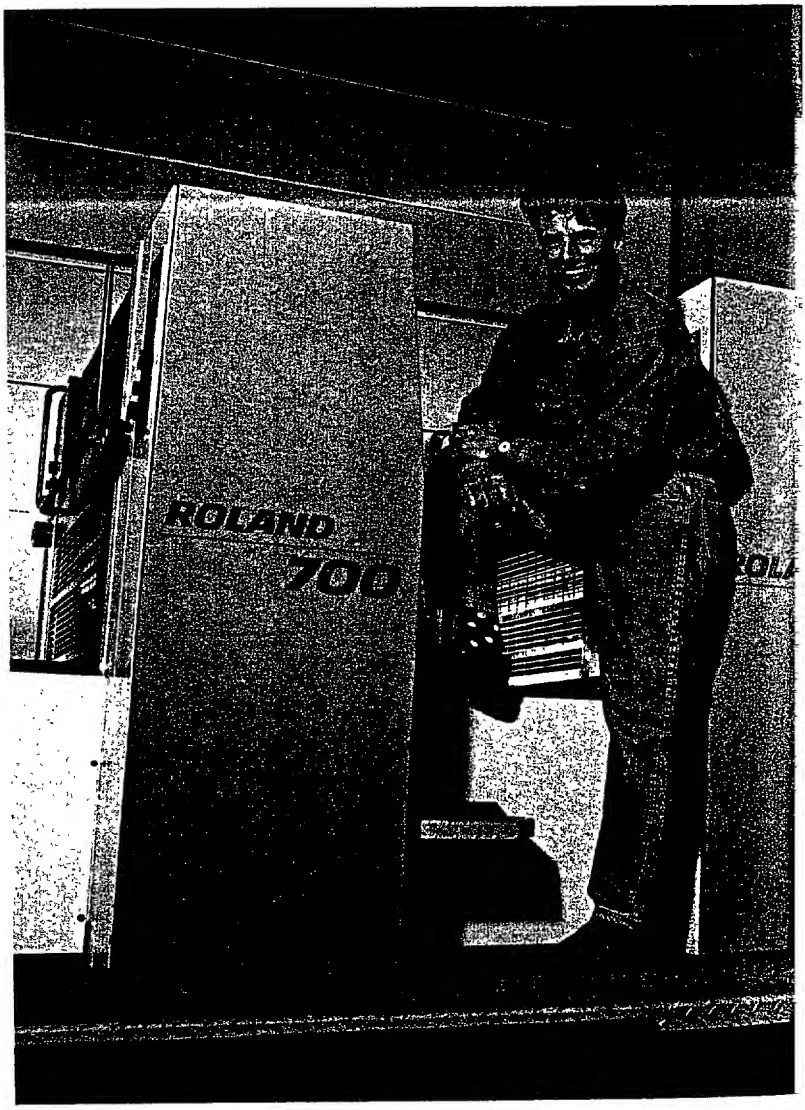
A pleasant working environment increases productivity

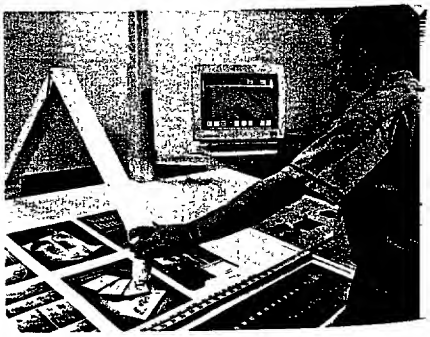
What qualities do you expect from your press to make it attractive as a workplace? Purposeful design? Good ergonomics? Safety and simple operation? As you know, productivity is strongly influenced by these factors. With a Roland 700, you are providing your operating staff with a press that conforms to all the demands placed on a modern production facility.

Ergonomics is a big word that sometimes covers small details. As an example, the operating controls on the Roland 700 are positioned to ensure ease of operation for both right and left-handed operators. But the ergonomics of the Roland 700 goes way beyond detail: the entire press is designed to minimize physical effort and thus maximise efficiency. As an example, 63 cm space between the printing units is considerably more than that offered by comparable presses. Printers enjoy working on the Roland 700 and this increases productivity.

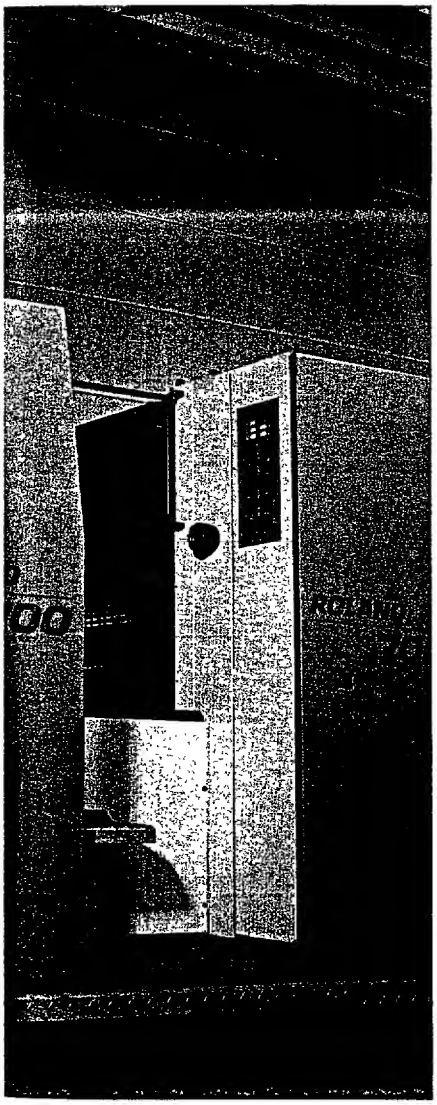
The PECOM Press Center speaks your language

Communication with the PECOM Press Center must be easy to understand. For this reason, many languages are available including Japanese for instance. Help texts are there to assist whenever you need any explanation of the console functions.



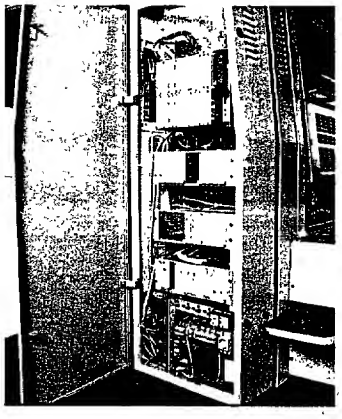


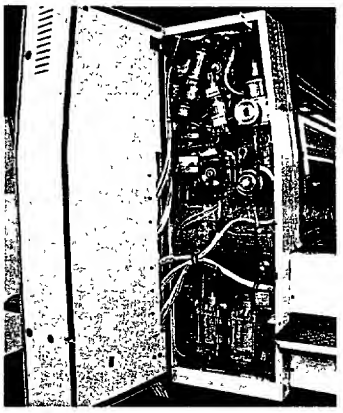
The Roland 700: the benchmark for easy and reliable operation



Central press control provides reliability and reduces operator tasks

The side covers are easily swung open to provide good access to the electronics and mechanics





The highest degree of operator safety

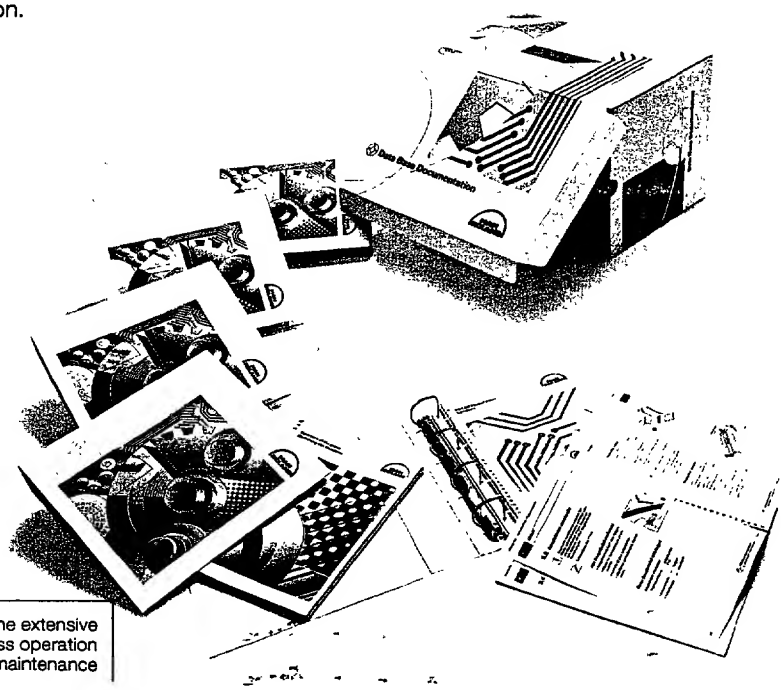
Whereas in earlier times manual tasks such as plate changing or hickey removal carried a high risk of accidents, the automation of such tasks on the Roland 700 has removed this danger. The safety systems go further than the regulations demand. And it goes without saying that the Roland 700 has the German GS seal (safety approved) and conforms to the new safety standards of the European Union.

Well designed operating manuals for easy understanding

A good press must have a good operating manual. The Roland 700 operating manual provides the printer with all the information he needs, logically arranged and easy to understand. New staff can quickly learn to operate the Roland 700.

Shorter maintenance times

Press maintenance is essential to protect your investment. But good and thorough maintenance need not take a lot of time. Central lubrication and central oil changing for all units increases operational reliability and also productivity.



Clearly laid out: the extensive documentation for press operation and maintenance

All over the world – partners in printing

In all countries and in every region, no matter how remote: wherever you may be printing, you will find an MAN Roland sales and service partner. We will not only provide guidance in investment decisions but also provide you with full service in all aspects of printing.

A dense network of well-qualified sales and service partners in every part of the world can only be created and supported by a strong organization – such as MAN Roland.

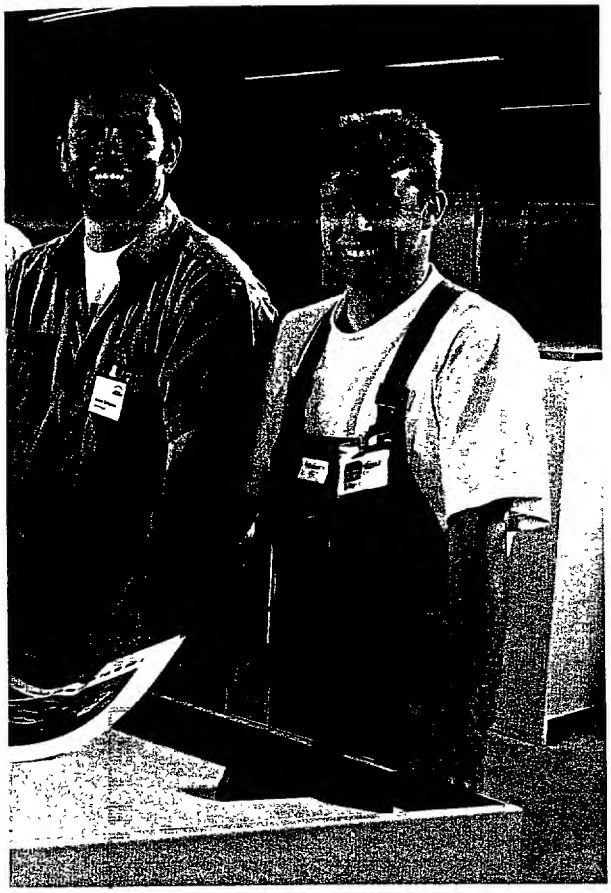
Our partners are there to provide you with information and guidance to assist you with your investment decision. Which would be the best press for your specific job structure? How should the press be equipped? What are the market developments and trends? These are the type of questions that they can answer for you in full detail. You can find out how to contact our sales and service partner for your region by calling the following numbers:

Tel: +49 69 83 05-0
Fax: +49 69 83 05-1440

First look, then decide

A demonstration makes the decision easier. Apart from guidance in the form of discussions, we can also offer you live demonstrations in our Graphic Center in Mühlheim, close to Frankfurt. This allows you to judge for yourself the production possibilities of the Roland 700. We can also show you here state-of-the-art developments in printing.

Printers' training courses in the Offenbach Graphic Center



Training on the Roland 700

Guidance in the investment decision is important but the services we offer go well beyond that. All of our international partners provide well-qualified training for your printers. And we also run printers' training courses in our Graphic Center that provide intensive, practical training in press operation. Depending on the extent of training needed, these courses last from three days up to two weeks. This ensures that you can take full advantage of the opportunities that modern press technology offers without delay.

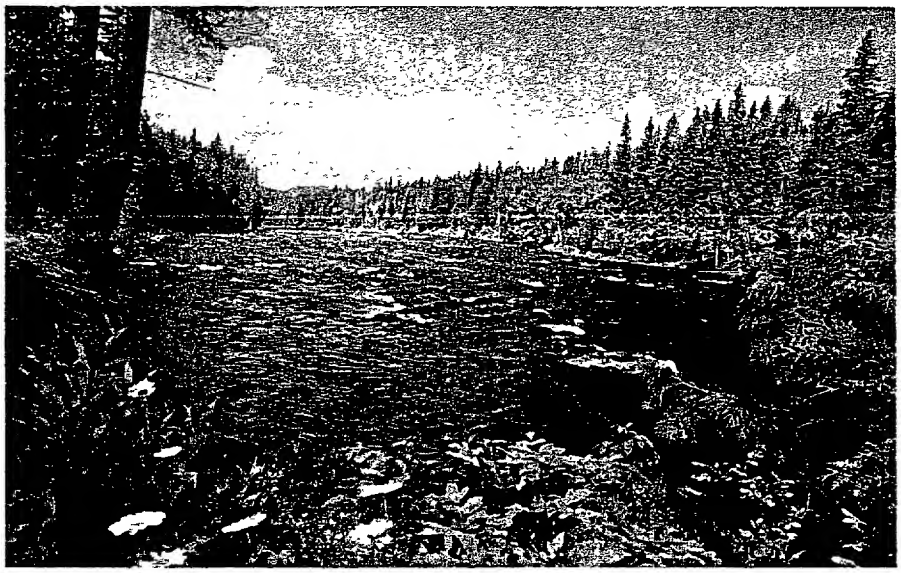
Good after-sales service vital for customer satisfaction

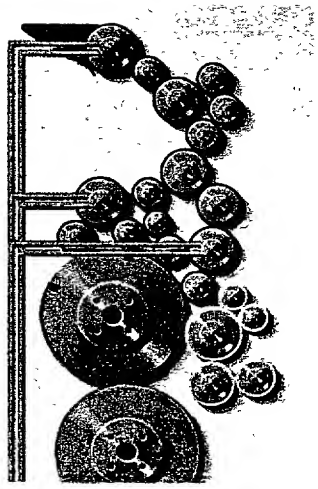
We are very much aware of this and are always ready to assist you. Should a breakdown occur, despite all safeguards and checks in manufacturing, our swift service response ensures that this does not mean a serious loss of production. Any press malfunction is detected by the diagnostic system in the Roland 700 and the system indicates in clear text at the PECOM Press Center where the error is located. This information can be conveyed to your sales and service partner who will assist immediately with a remote diagnosis or send a technician to you. All of our partners hold spare parts in stock to ensure these are available to you without delay. Supply of spare parts worldwide is further supported by a fast and efficient service from our headquarters in Offenbach.

Print demonstrations (right) or training: the Graphic Center team (below) looks forward to your visit

Synergies – environment protection and economy

Synergy means the working together of two or more factors to produce an effect greater than the sum of their individual effects. An example of this is the result of environment-protecting measures allied with cost savings as offered by the Roland 700. It doesn't matter whether it is less waste paper, less solvents or exact dosage of inks and coatings: what is environment-compatible is always also economical.





Inking unit temperature control: an important factor for waterless offset

Washing methods – a contribution to environment protection

Chemical cleaning agents harm the environment and are expensive. The new brush-type washing device used on the Roland 700 uses less than 0.1 litre of washing solution per printing unit per washing cycle. This is not only a benefit for man and nature but it also saves costs. Even greater cost savings are provided by the recycling unit which can clean used solutions with a recovery rate of 97 per cent.

The washing process does not cause any spray mist, which means you can also use vegetable oil-based washing agents or agents with a higher flash-point than normal without any problems.

And more good news for the environment: the washing brushes have a long useful life of around two years. When they are worn, they are not simply thrown away - the core can be fitted with a new brush covering.

Reduce fountain solution additives

The use of isopropyl alcohol as a fountain solution additive is coming under increasingly critical scrutiny because it is hazardous to health and the environment.The fountain solution cooling and dosage units of the Roland 700 enable alcohol levels to be reduced by around 70% compared to levels common previously.

Inking unit temperature control on the Roland 700 stabilizes the temperature in the printing units. This not only reduces fountain solution consumption but it also provides ideal conditions for waterless offset printing – an extremely environment-compatible alternative.

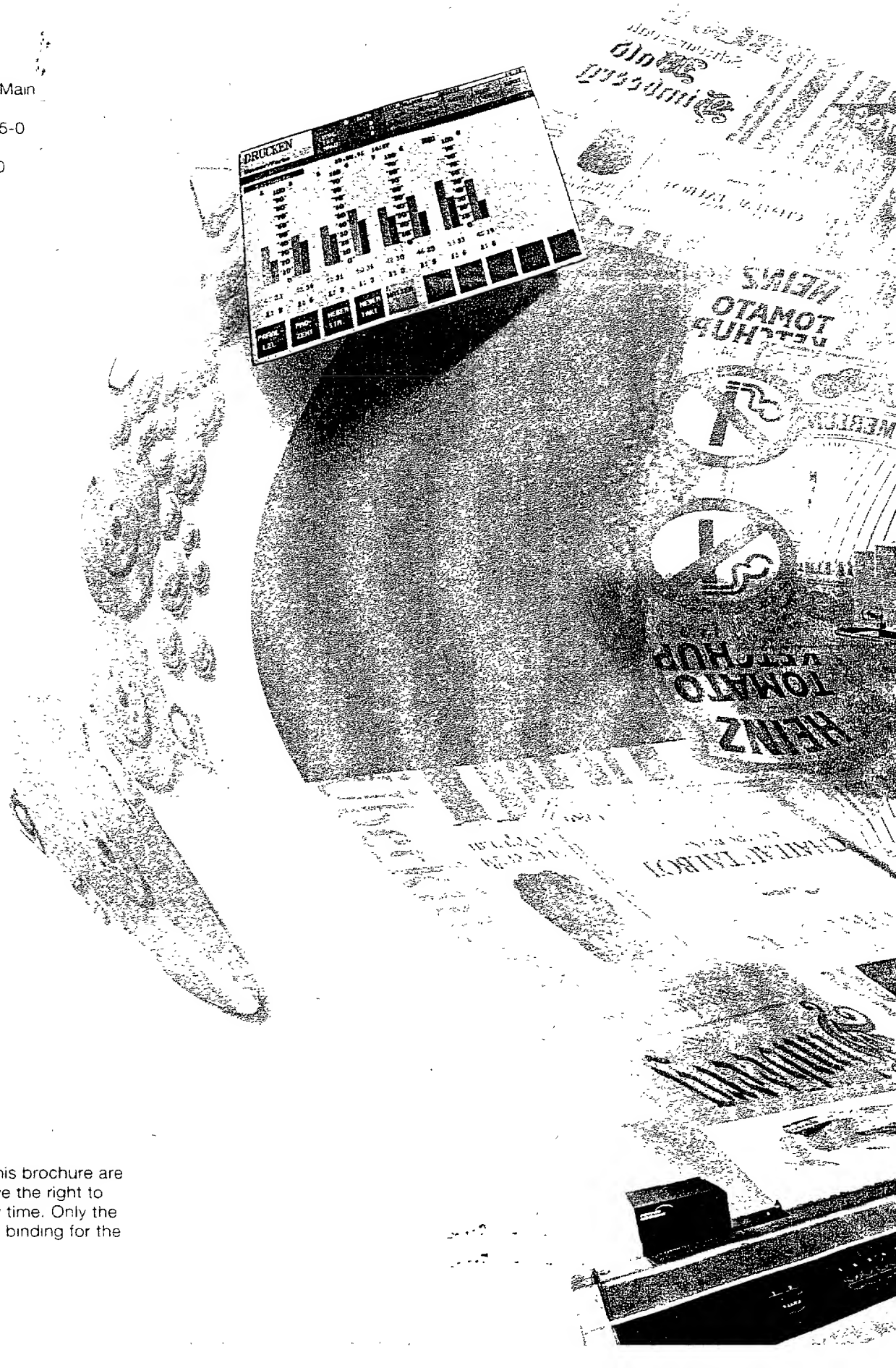
Furthermore...

...we are very environment conscious in our manufacturing and work according to very strict rules in this regard – for the benefit of all of us.

MAN Roland
Druckmaschinen AG

Sheetfed Press Division
PO Box 10 12 64
D-63012 Offenbach am Main
Germany
Telephone + 49 69 83 05-0
Telex 4152 852 mro d
Fax + 49 69 83 05-14 40

Printed in Germany



R 707 3B LV	740x1040	340x480	715x1020[1]	1180	1080	15238	3450	2140	15 000	7
R 708 3B LV	740x1040	340x480	715x1020[1]	1180	1080	16418	3450	2140	15 000	8

ROLAND 700 convertible perfecting press

Model	Sheet size (mm): max.[2]	min.	Image area (mm): max.[3]	Pile height (mm): Feeder	Delivery	Press dimensions (mm). Length	Width	Height	Speed[4] (sheets per hour)	Number of printing units
R 702 3B	720x1040	340x480	700x1020	1180	1080	7213	3450	2140	11 000	2
R 703 3B	720x1040	340x480	700x1020	1180	1080	8393	3450	2140	11 000	3
R 704 3B	720x1040	340x480	700x1020	1180	1080	9573	3450	2140	11 000	4
R 705 3B	720x1040	340x480	700x1020	1180	1080	10753	3450	2140	11 000	5
R 706 3B	720x1040	340x480	700x1020	1180	1080	11933	3450	2140	11 000	6
R 707 3B	720x1040	340x480	700x1020	1180	1080	13113	3450	2140	11 000	7
R 708 3B	720x1040	340x480	700x1020	1180	1080	14293	3450	2140	11 000	8

[1] Maximum image area of 730x1030 mm available on request

[2] Maximum sheet size in straight printing is 740x1040 mm

[3] Maximum image area in straight printing is 715x1020 mm

[4] The maximum speed in straight printing is 15,000 sheets per hour

The machine dimensions given above apply to the standard versions.

Please refer to the respective press installation plans for binding dimensions

Technical data (mm)

ROLAND 700

Model	Sheet size (mm): max.	min.	Image area (mm): max.	Pile height (mm). Feeder	Delivery	Press dimensions (mm) Length	Width	Height	Speed (sheets per hour)	Number of printing units
702 3B	740x1040	340x480	715x1020[1]	1180	1080	7213	3450	2140	15 000	2
R 703 3B	740x1040	340x480	715x1020[1]	1180	1080	8393	3450	2140	15 000	3
R 704 3B	740x1040	340x480	715x1020[1]	1180	1080	9573	3450	2140	15 000	4
R 705 3B	740x1040	340x480	715x1020[1]	1180	1080	10753	3450	2140	15 000	5
R 706 3B	740x1040	340x480	715x1020[1]	1180	1080	11933	3450	2140	15 000	6
R 707 3B	740x1040	340x480	715x1020[1]	1180	1080	13113	3450	2140	15 000	7
R 708 3B	740x1040	340x480	715x1020[1]	1180	1080	14293	3450	2140	15 000	8

ROLAND 700 *with coating module and extended delivery*

Model	Sheet size (mm). max.	min	Image area (mm): max	Pile height (mm): Feeder	Delivery	Press dimensions (mm). Length	Width	Height	Speed (sheets per hour)	Number of printing units
R 702 3B LV	740x1040	340x480	715x1020[1]	1180	1080	9338	3450	2140	15 000	2
R 703 3B LV	740x1040	340x480	715x1020[1]	1180	1080	10518	3450	2140	15 000	3
R 704 3B LV	740x1040	340x480	715x1020[1]	1180	1080	11698	3450	2140	15 000	4
R 705 3B LV	740x1040	340x480	715x1020[1]	1180	1080	12878	3450	2140	15 000	5
R 706 3B LV	740x1040	340x480	715x1020[1]	1180	1080	14058	3450	2140	15 000	6

APL fully-automated plate changing	○	○	○	○	○	○	○
Automated register control (video magnifier)	○	○	○	○	○	○	○
Inline register control	○	○	○	○	○	○	○
CCI inking regulation	○	○	○	○	○	○	○
Multi-CCI inking regulation	○	○	○	○	○	○	○
Multi-CCI-2D inking regulation	○	○	○	○	○	○	○
Inking unit temperature control	○	○	○	○	○	○	○
LCS (Low Coverage Stabilisation)	○	○	○	○	○	○	○
One or two perfecting stations	○	○	○	○	○	○	○
Automatic impression cylinder washing device	○	○	○	○	○	○	○
Coating module	○	○	○	○	○	○	○
Coating module with anilox roller and chamber-type doctor blade	○	○	○	○	○	○	○
PECOM networking	○	○	○	○	○	○	○

● standard
○ optional

This table contains a selection of important items of equipment. Further information available on request. We reserve the right to make technical changes without prior notice.

status 5/95

Press equipment

MAN ROLAND

	R 702	R 703	R 704	R 705	R 706	R 707	R 708
Automatic sheet size setting	●	●	●	●	●	●	●
Automatic stock thickness adjustment	●	●	●	●	●	●	●
Circumferential, lateral and diagonal register control	●	●	●	●	●	●	●
RCI inking control	●	●	●	●	●	●	●
Automatic inking unit separation	●	●	●	●	●	●	●
Remote setting of ink oscillation timing	●	●	●	●	●	●	●
Oscillation setting of the forme inking rollers	●	●	●	●	●	●	●
Roland Deltamatic dampener	●	●	●	●	●	●	●
Automatic inking roller washing device	●	●	●	●	●	●	●
Automatic blanket washing device	●	●	●	●	●	●	●
Non-stop device for feeder and delivery	●	●	●	●	●	●	●
Special surfaces for plate, blanket and impression cylinders	●	●	●	●	●	●	●
Printing with or without bearer contact	●	●	●	●	●	●	●
Diagnostic system	●	●	●	●	●	●	●
Data transmission via fibre optics	●	●	●	●	●	●	●
PPL Automated plate changing	○	○	○	○	○	○	○

Technical data (inch)

MAN ROLAND

ROLAND 700

Model	Sheet size (inch): max.	Sheet size (inch): min.	Image area (inch): max.	Pile height (inch): Feeder	Pile height (inch): Delivery	Press dimensions (inch). Length	Press dimensions (inch). Width	Press dimensions (inch). Height	Speed (sheets per hour)	Number of printing units
R 702 3B	29.13 x 40.94	13.39 x 18.90	28.15 x 40.16[1]	40.46	42.52	23'7.99	11'3.82	84.25	15,000	2
R 703 3B	29.13 x 40.94	13.39 x 18.90	28.15 x 40.16[1]	40.46	42.52	27'6.46	11'3.82	84.25	15,000	3
R 704 3B	29.13 x 40.94	13.39 x 18.90	28.15 x 40.16[1]	40.46	42.52	31'4.88	11'3.82	84.25	15,000	4
R 705 3B	29.13 x 40.94	13.39 x 18.90	28.15 x 40.16[1]	40.46	42.52	35'3.35	11'3.82	84.25	15,000	5
R 706 3B	29.13 x 40.94	13.39 x 18.90	28.15 x 40.16[1]	40.46	42.52	39'1.81	11'3.82	84.25	15,000	6
R 707 3B	29.13 x 40.94	13.39 x 18.90	28.15 x 40.16[1]	40.46	42.52	43'0.28	11'3.82	84.25	15,000	7
R 708 3B	29.13 x 40.94	13.39 x 18.90	28.15 x 40.16[1]	40.46	42.52	46'10.71	11'3.82	84.25	15,000	8

ROLAND 700 *with coating module and extended delivery*

Model	Sheet size (inch): max.	Sheet size (inch): min.	Image area (inch): max.	Pile height (inch): Feeder	Pile height (inch): Delivery	Press dimensions (inch): Length	Press dimensions (inch): Width	Press dimensions (inch): Height	Speed (sheets per hour)	Number of printing units
R 702 3B LV	29.13 x 40.94	13.39 x 18.90	28.15 x 40.16[1]	40.46	42.52	30'7.64	11'3.82	84.25	15,000	2
R 703 3B LV	29.13 x 40.94	13.39 x 18.90	28.15 x 40.16[1]	40.46	42.52	34'6.10	11'3.82	84.25	15,000	3
R 704 3B LV	29.13 x 40.94	13.39 x 18.90	28.15 x 40.16[1]	40.46	42.52	38'4.57	11'3.82	84.25	15,000	4
R 705 3B LV	29.13 x 40.94	13.39 x 18.90	28.15 x 40.16[1]	40.46	42.52	42'3.00	11'3.82	84.25	15,000	5

R 707 3B LV	29.13 x 40.94	13.39 x 18.90	28.15 x 40.16[1]	40.46	42.52	49'11.93	11'3.82	84.25	15,000	7
R 708 3B LV	29.13 x 40.94	13.39 x 18.90	28.15 x 40.16[1]	40.46	42.52	53'10.38	11'3.82	84.25	15,000	8

ROLAND 700 convertible perfecting press

Model	Sheet size (inch): max.[2]	min.	Image area (inch): max.[3]	Pile height (inch): Feeder	Delivery	Press dimensions (inch): Length	Width	Height	Speed[4] (sheets per hour)	Number of printing units
R 702 3B	28.35 x 40.94	13.39 x 18.90	27.56 x 40.16	40.46	42.52	23'7.99	11'3.82	84.25	11,000	2
R 703 3B	28.35 x 40.94	13.39 x 18.90	27.56 x 40.16	40.46	42.52	27'6.46	11'3.82	84.25	11,000	3
R 704 3B	28.35 x 40.94	13.39 x 18.90	27.56 x 40.16	40.46	42.52	31'4.88	11'3.82	84.25	11,000	4
R 705 3B	28.35 x 40.94	13.39 x 18.90	27.56 x 40.16	40.46	42.52	35'3.35	11'3.82	84.25	11,000	5
R 706 3B	28.35 x 40.94	13.39 x 18.90	27.56 x 40.16	40.46	42.52	39'1.81	11'3.82	84.25	11,000	6
R 707 3B	28.35 x 40.94	13.39 x 18.90	27.56 x 40.16	40.46	42.52	43'0.28	11'3.82	84.25	11,000	7
R 708 3B	28.35 x 40.94	13.39 x 18.90	27.56 x 40.16	40.46	42.52	46'10.71	11'3.82	84.25	11,000	8

[1] Maximum image area of 28.74 x 40.55 inches available on request

[2] Maximum sheet size in straight printing is 29 13 x 40.94 inches

[3] Maximum image area in straight printing is 28 15 x 40.16 inches

[4] The maximum speed in straight printing is 15,000 sheets per hour

The machine dimensions given above apply to the standard versions

Please refer to the respective press installation plans for binding dimensions

Press equipment

	R 702	R 703	R 704	R 705	R 706	R 707	R 708
Automatic sheet size setting	●	●	●	●	●	●	●
Automatic stock thickness adjustment	●	●	●	●	●	●	●
Circumferential, lateral and diagonal register control	●	●	●	●	●	●	●
RCI inking control	●	●	●	●	●	●	●
Automatic inking unit separation	●	●	●	●	●	●	●
Remote setting of ink oscillation timing	●	●	●	●	●	●	●
Oscillation setting of the forme inking rollers	●	●	●	●	●	●	●
Roland Deltamatic dampener	●	●	●	●	●	●	●
Automatic inking roller washing device	●	●	●	●	●	●	●
Automatic blanket washing device	●	●	●	●	●	●	●
Non-stop device for feeder and delivery	●	●	●	●	●	●	●
Special surfaces for plate, blanket and impression cylinders	●	●	●	●	●	●	●
Printing with or without bearer contact	●	●	●	●	●	●	●
Diagnostic system	●	●	●	●	●	●	●
Data transmission via fibre optics	●	●	●	●	●	●	●
PPL Automated plate changing	○	○	○	○	○	○	○

APL fully-automated plate changing	○	○	○	○	○	○	○
Automated register control (video magnifier)	○	○	○	○	○	○	○
Inline register control	○	○	○	○	○	○	○
CCI inking regulation	○	○	○	○	○	○	○
Multi-CCI inking regulation	○	○	○	○	○	○	○
Multi-CCI-2D inking regulation	○	○	○	○	○	○	○
Inking unit temperature control	○	○	○	○	○	○	○
LCS (Low Coverage Stabilisation)	○	○	○	○	○	○	○
One or two perfecting stations	○	○	○	○	○	○	○
Automatic impression cylinder washing device	○	○	○	○	○	○	○
Coating module	○	○	○	○	○	○	○
Coating module with anilox roller and chamber-type doctor blade	○	○	○	○	○	○	○
PECOM networking	○	○	○	○	○	○	○

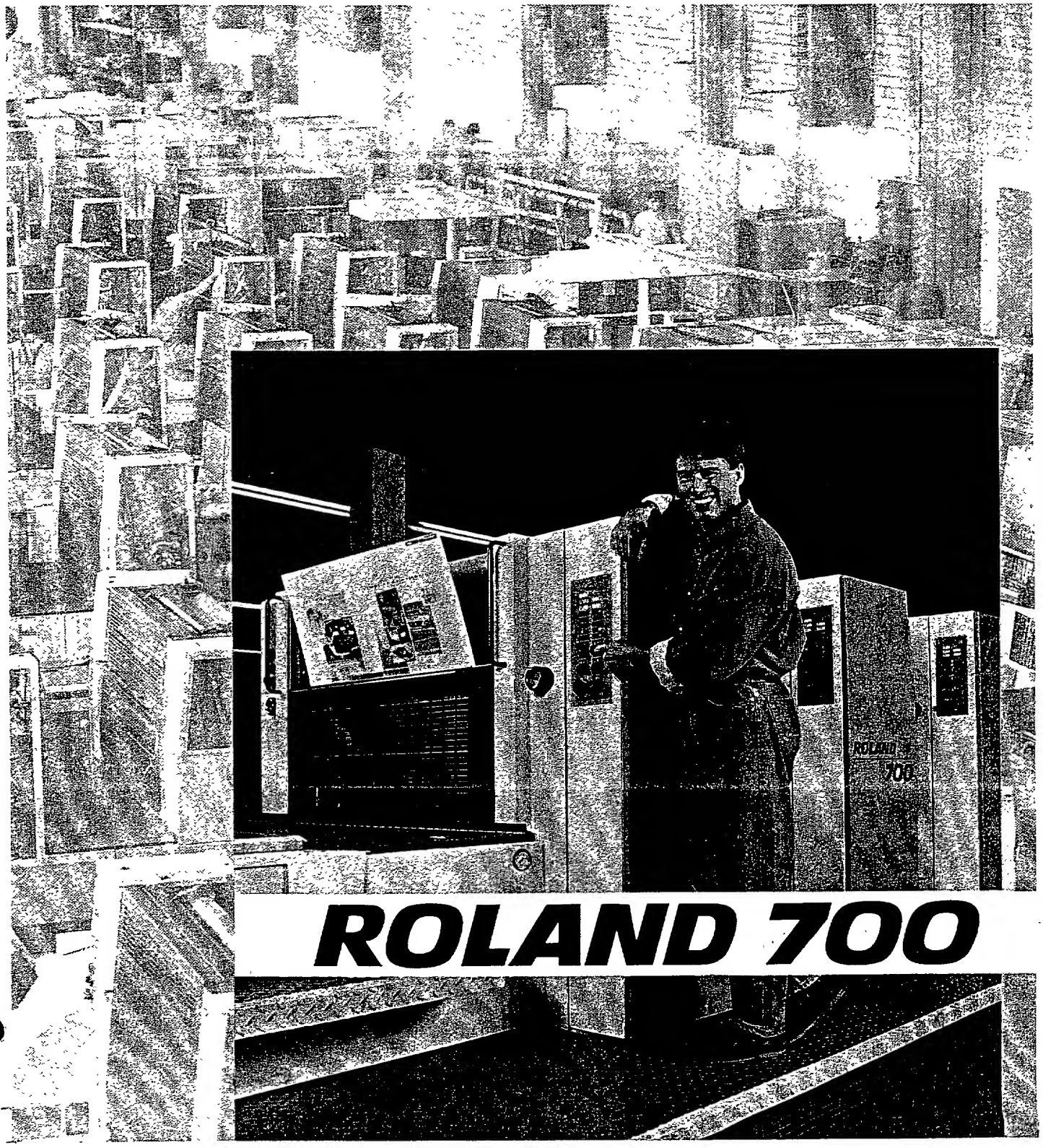
status 5/95

● standard
○ optional

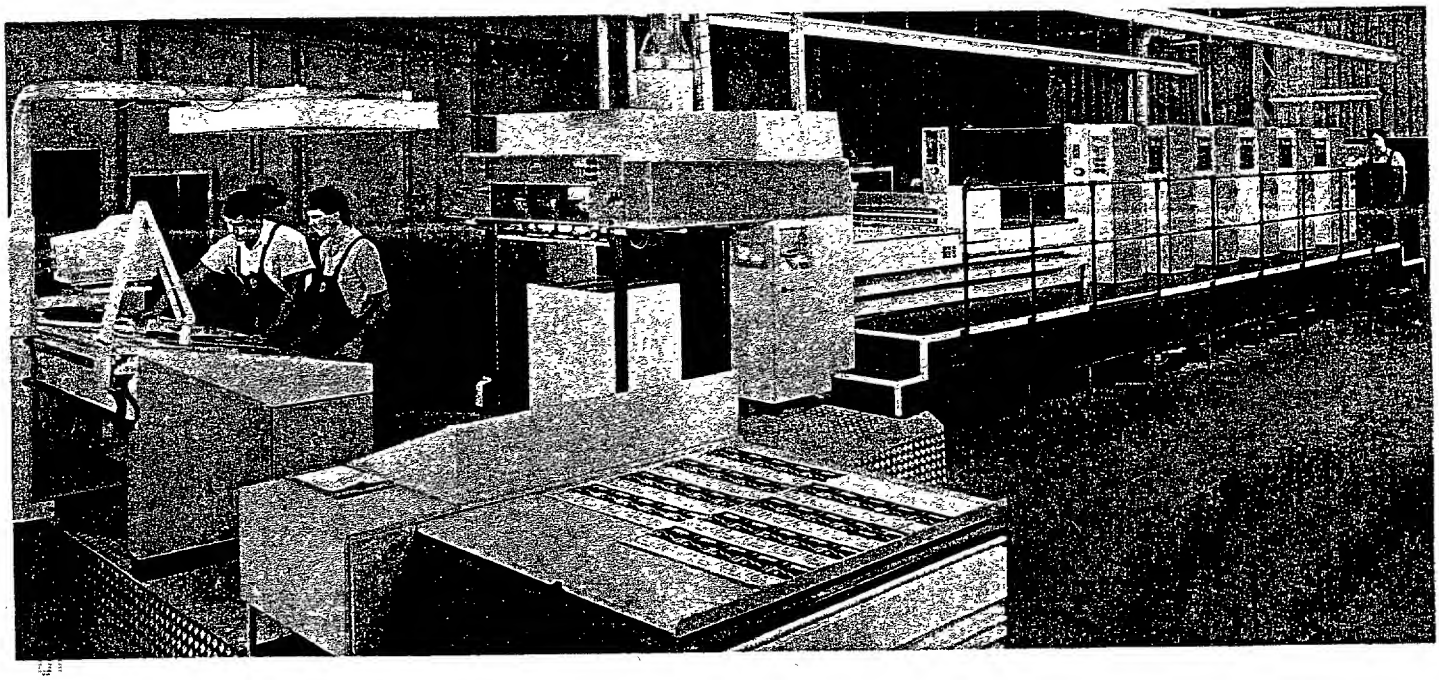
This table contains a selection of important items of equipment. Further information available on request. We reserve the right to make technical changes without prior notice.

Roland 700 –
into the future of the medium format
with a new dimension in performance

MAN ROLAND



Roland 700 – into the future of the medium format with a new dimension in performance



A new performance dimension within a digitalised total concept

To relieve the printer of routine work, not automation at any price but instead automation which brings advantages for the printer, the printing company and its customers – these were the objectives of MAN Roland in developing a new and trendsetting press technology.

The Roland 700, the new alternative in the medium size. The high degree of automation of this unit design press, combined with a maximum speed of 15.000 sheets per hour, ensures an extraordinarily high performance capability.

The Roland 700, like the Roland 600 D, is a part of an integrated digital concept: A technology which employs the advantages of automation and central operation of all major press functions from the PECOM Press Center, using digital signal transmission with fibre optics, to ensure high productivity, a high degree of production reliability and high quality.

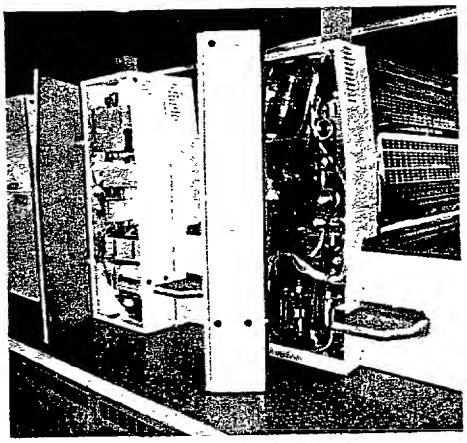
Beyond standardisation and automation, the technology of the Roland 700 allows the press to be linked into the PECOM process electronic concept which provides integration of the printing process into a system for high-volume production.

The Roland 700 symbolises the highest level of the technological philosophy of MAN Roland in the medium format. Designed to meet the demands of the printing plants of tomorrow, the Roland 700 stands out by virtue of consistently high performance as a fundamental part of an integratable, open system for economical and efficient high-volume production.

The PECOM Press Center for all machine functions – More time for quality even with higher productivity

The operation of the Roland 700 takes place at the PECOM Press Center. These operations include sheet size settings, inking adjustments, inking regulation, register adjustments, dampening fluid feeding as well as the operation of inking roller and blanket washing systems, the powder spraying device and the dampening fluid conditioning unit

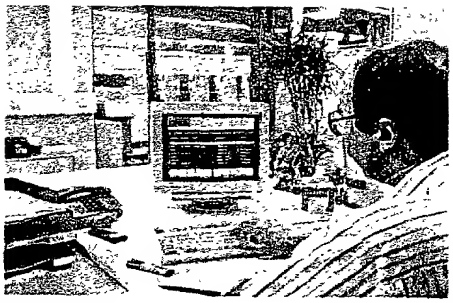
The colour monitor replaces a multitude of display instruments, for example: running speed, inking and dampening unit settings, total counter, run counter and job preset.



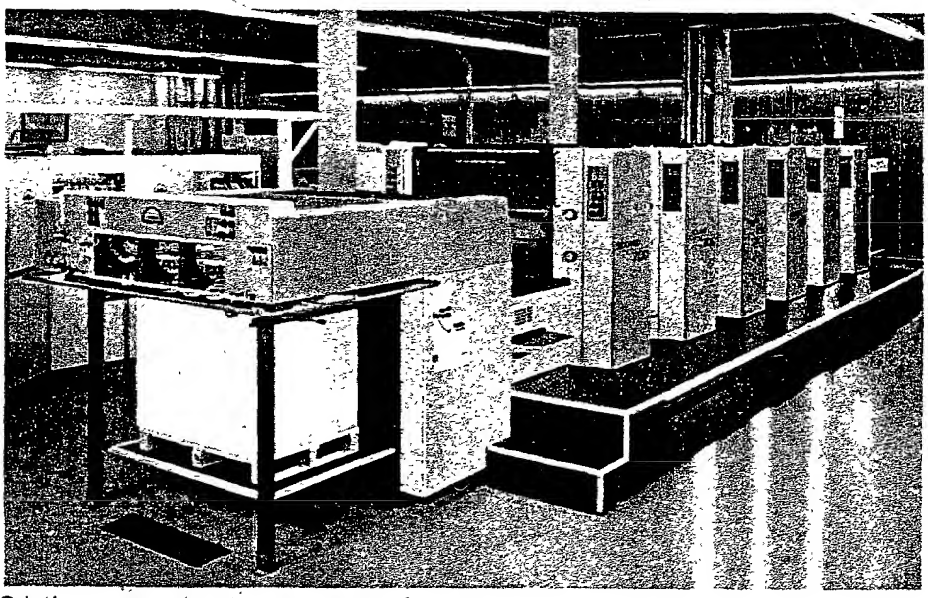
This form of display considerably increases production reliability. The simple operation is via function keys which quickly access the module to be adjusted and where the functions for that module are grouped. Selection and execution are quickly accomplished, the printer is in full control of his press from a central position and can concentrate fully on print quality.

Up to 5.000 jobs including presetting, measuring and regulating parameters can be stored in, and managed from, the PECOM Press Center. With repeat jobs this means that it is possible to call up the previous settings and have practically all the necessary data immediately available. Sheet size, impression setting, ink slides, vibrator setting, powder sprayer etc. are automatically set by keystroke.

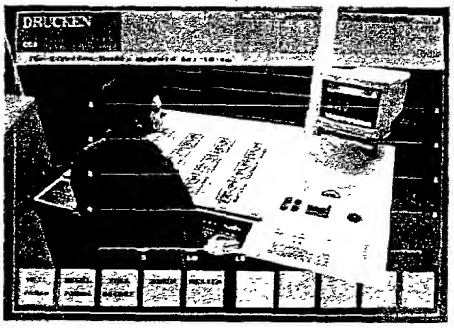
The pertinent control system is integrated directly in the sideframes of the printing units. As every control unit has its own computer, signal transmission paths are short. The information exchange unit to unit, and between units and the PECOM Press Center, is by means of fibre optics. Messages are in a clear text form. Help texts indicate possible error reasons (e. g. open guard) and suggest corrective action.



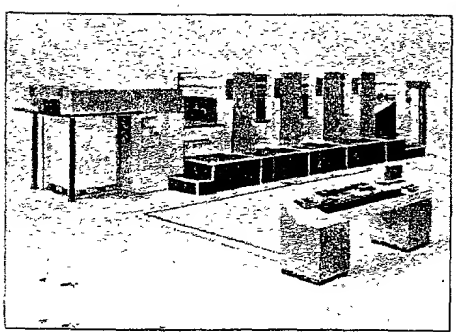
TPP-Station

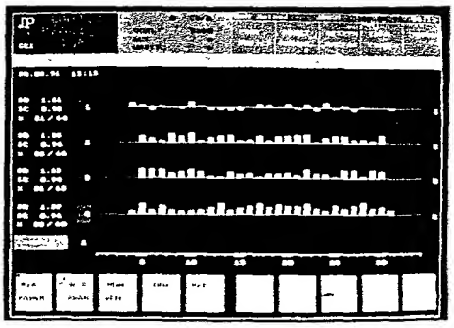


Printing press



PECOM Press Center





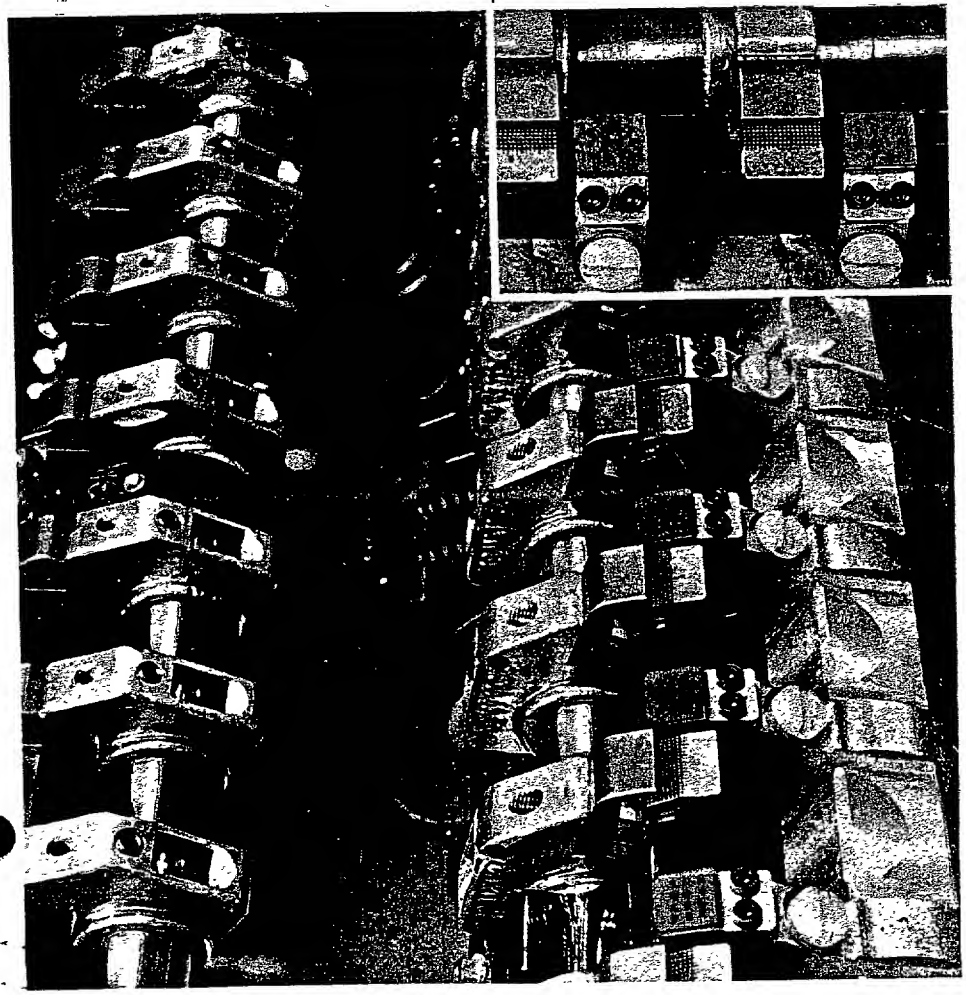
Roland 700 – single cylinder perfecting for flexibility with high performance

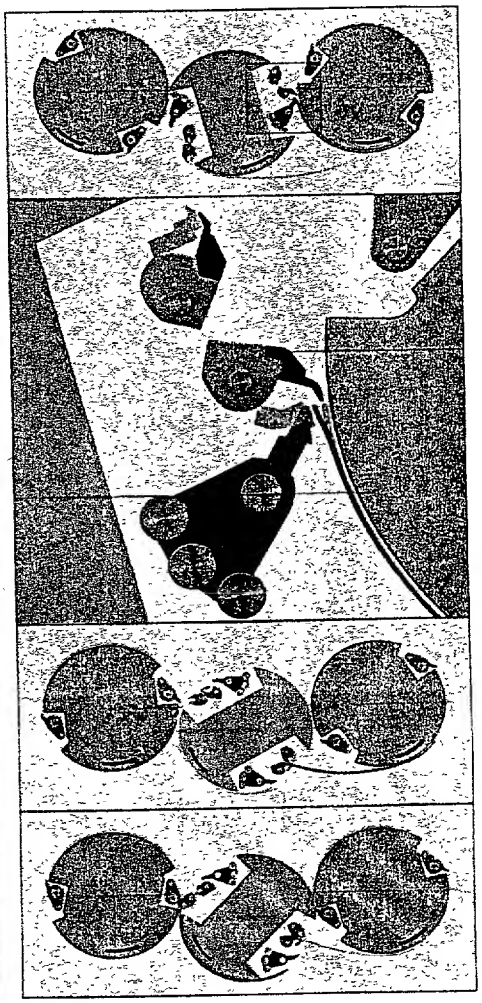
The Roland 700 with perfecting unites the highest degree of automation with the advantages of printing both sides of the sheet in one pass. This concept permits the production mode to be changed in order to process the job in the most economical manner. This means flexibility in job planning for the printing plant which enables fast response to the requirements of the customer.

In accordance with the overall operational philosophy of the Roland 700, the change of production mode is made fully automatically from the PECOM Press Center, simply and safely, in less than one minute.

In the perfecting mode, suckers in the perfecting cylinder grasp the rear edge of the sheet in order to raise and tauten it for the transfer to the perfecting cylinder grippers (illustration 1). The sheet front edge is not released by the grippers in the preceding impression cylinder until it is firmly gripped at the rear edge by the perfecting cylinder grippers. Because the sheet is at all times held by a gripper system, reliable sheet transfer is ensured even at high speeds. In the next phase, the perfecting grippers transfer the sheet to the so-called straight printing grippers (illustration 2). What was the sheet rear edge becomes the new front edge as it is transferred to the impression cylinder of the next printing unit (illustration 3). A missing sheet detector is provided between the perfecting cylinder and the impression cylinder to safeguard production.

The flat angle of sheet travel enables trouble-free processing of stocks up to 0.4 mm thick at a maximum speed of 11,000 sheets per hour in the perfecting mode. The patented special surface structure of the impression and perfecting cylinders avoids adherence and smearing and ensures the highest print quality for perfected work.





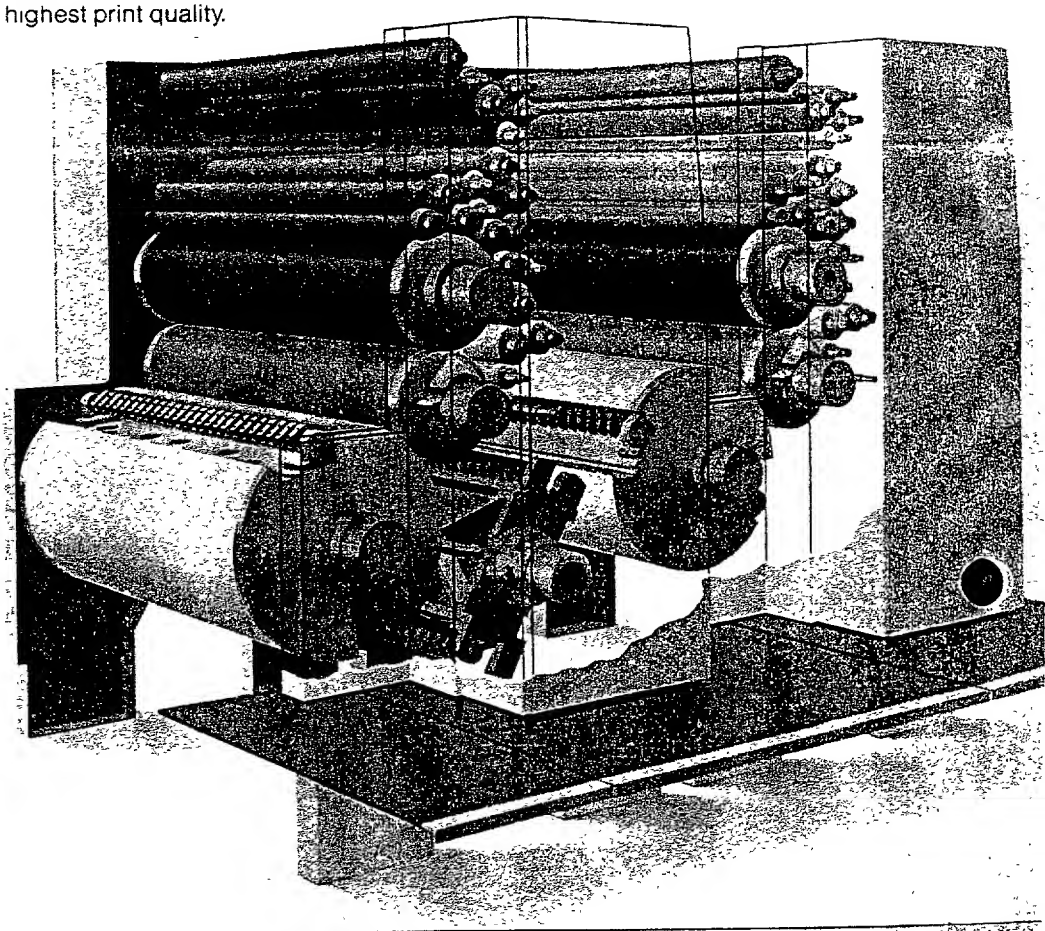
Roland 700 – innovative technology in unit design for the highest efficiency

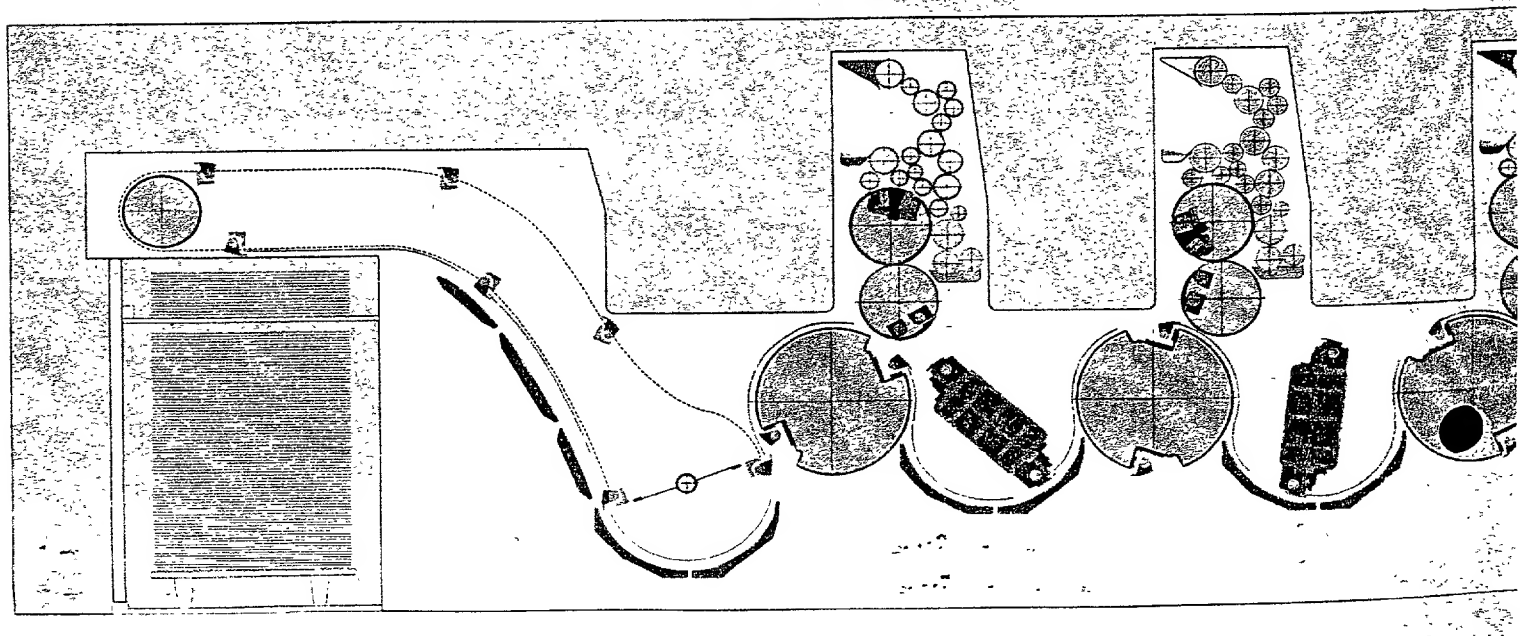
The Roland 700 is the new sheet-fed press in unit design with double diameter impression cylinders and the Transferter transfer system.

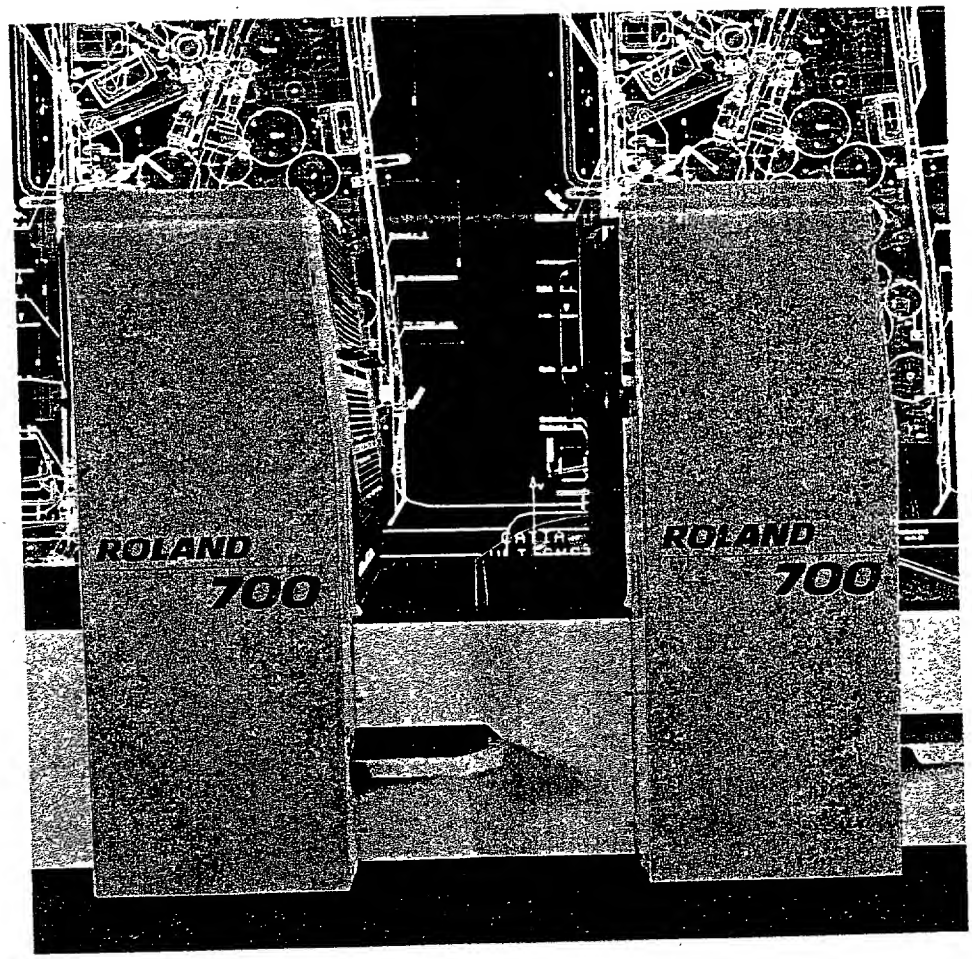
The size and the arrangement of the cylinders and the Transferter, combined with the slender design of the printing units, provide especially good accessibility and a high level of operator comfort.

The Transferter concept does away with setting work on transfer cylinders and ensures high printing quality at production speeds of up to 15.000 sheets per hour. The design permits optimal sheet transport with minimal bending, thus giving a relatively flat travel path, and a minimum of sheet transfer points. This means perfect register and a minimum of sheet guiding elements, thus reducing the risk of marking. The sheet is fully printed before transfer commences. The Transferter concept makes a large contribution to the especially short makeready times of the Roland 700.

The new computer-optimised inking unit, along with the Roland Deltamatic dampener which permits either integrated or separated dampening, reacts extremely quickly. This further reduces startup time and startup waste and provides the highest print quality.






ROLAND
700
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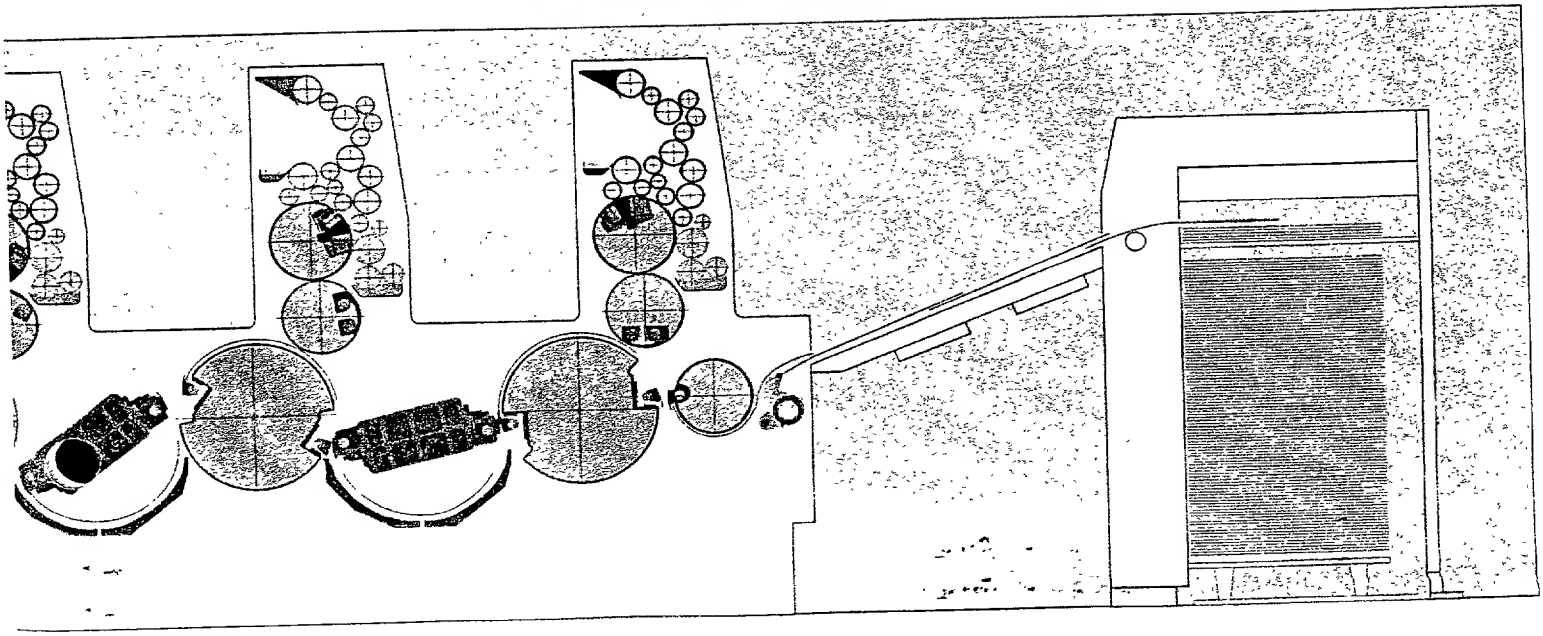
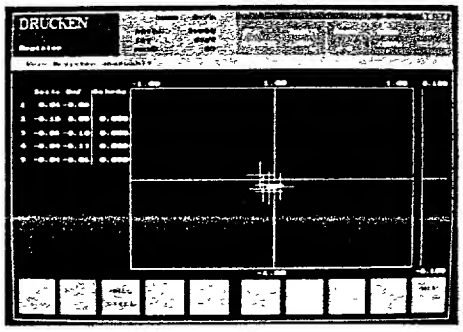
700





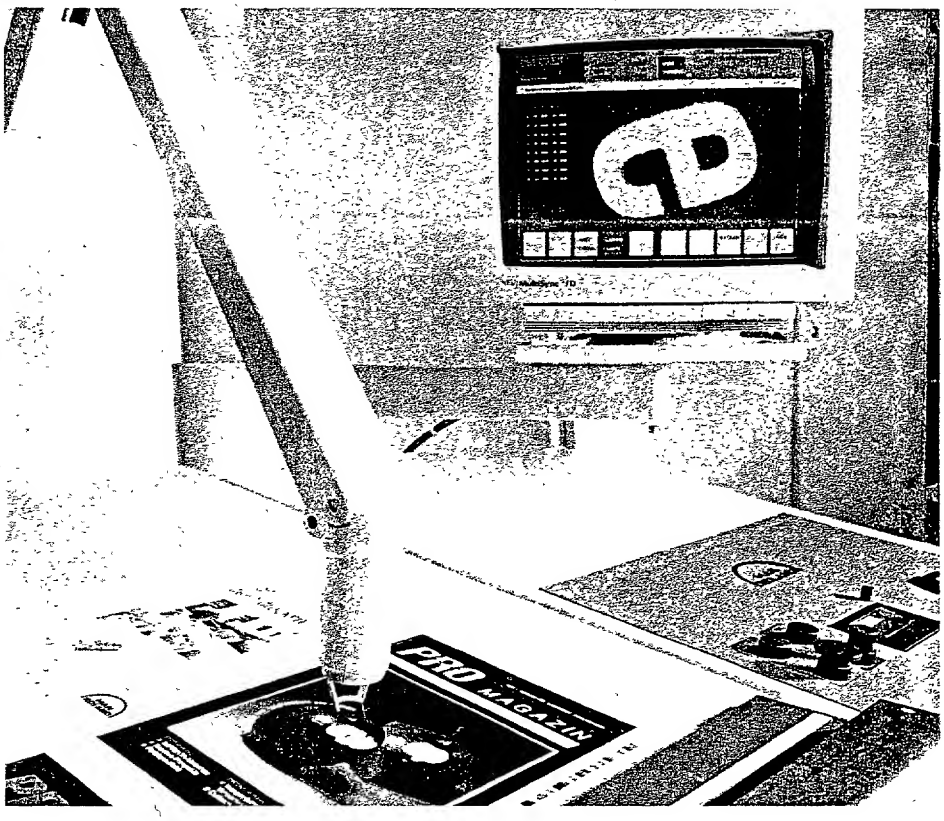
RQM (**R**egister and **Q**uality **M**agnifier). Register control and semi-automatic regulation

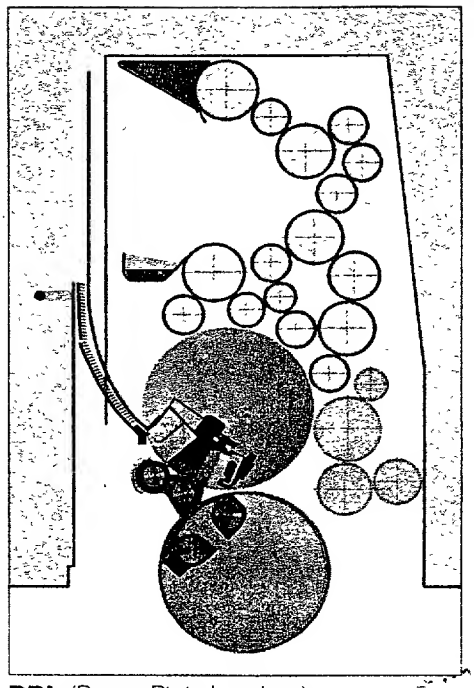
The register control is done from the PECOM Press Center. The printer can decide whether to make manual corrections via the remote register control or to correct at the touch of a key by using the RQM (optional equipment). The objective measurement of the RQM reduces the number of register corrections. The settings are always precise and make-ready times are reduced.

The fitting of the formes is also done much faster. There is no need for special register crosses. With RQM it is also possible to enlarge image segments, display these on the process monitor and use them for register correction.

APD (**A**utomatic printing **P**ressure adjustment **D**evice). Automatic impression setting as standard equipment.

The stock thickness is entered at the PECOM Press Center and all blanket cylinders move to the appropriate distance from the impression cylinders. Different settings for individual units are possible and this is also done from the Press Center.



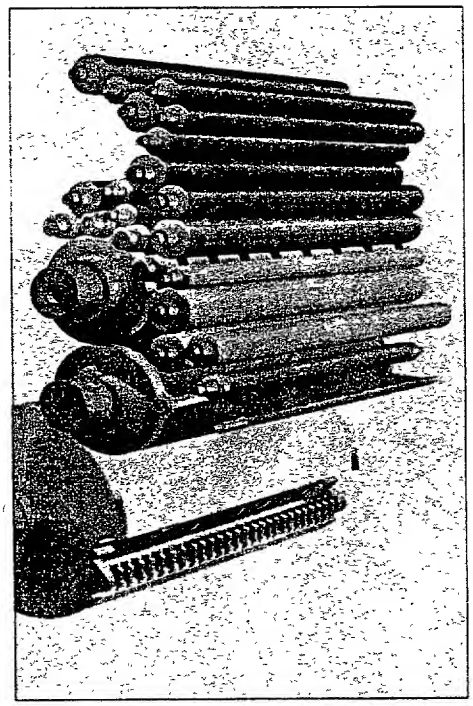


PPL (Power Plate Loading)

PPL (**P**ower **P**late **L**oading) and **APL** (**A**utomatic **P**late **L**oading). Automatic plate mounting and automatic plate changing.

With the automatic plate mounting system PPL (optional), all the printer has to do is insert the plate into the clamps and this is assisted by a guiding device. Then, on pressing a button, the plate is firmly clamped and tensioned. The objective of this system is to provide exact plate mounting so that even the first sheet is in register.

With APL, the automatic plate changing system, no manual steps are necessary. While the press is running, plates for the next job can be placed in the plate changing facility located at the printing unit. Plate changing is effected by push-button fully automatically in less than one minute per printing unit – on all units or on selected units. The old plates can be removed from the devices while the press is running on the new job. Just like PPL, the system can use new plates or standing plates with bent edges. Both APL and PPL offer highly accurate register and also correction facilities when needed with difficult papers.



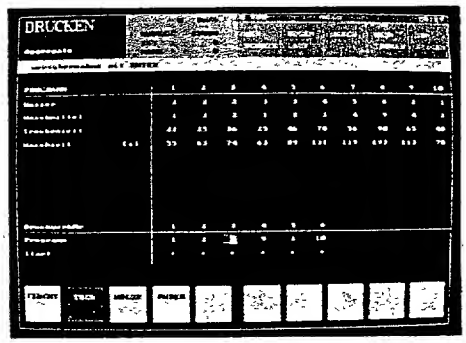
ABD (**A**utomatic **B**lanket Cylinder washing **D**evice)

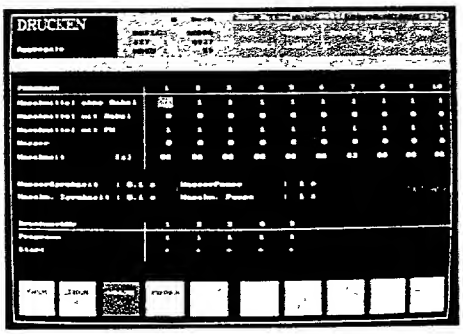
A blanket washing device is standard equipment. It is activated from the PECOM Press Center and provides fast cleaning of the blankets. A variety of washing programmes can be defined, with separate settings for the amount of water and solvent, to suit differing washing requirements. Ink and solvent residue is absorbed by the cleaning cloth. The location of the device below the dampening unit means that the good accessibility to the plate and blanket cylinders is maintained.

ARD (**A**utomatic **R**oller washing **D**evice)

The Roland 700 also has an automatic ink roller washing device as standard equipment. A variety of washing programmes can be defined, with separate settings for water and solvent to suit differing washing requirements. The ARD is also activated from the PECOM Press Center.

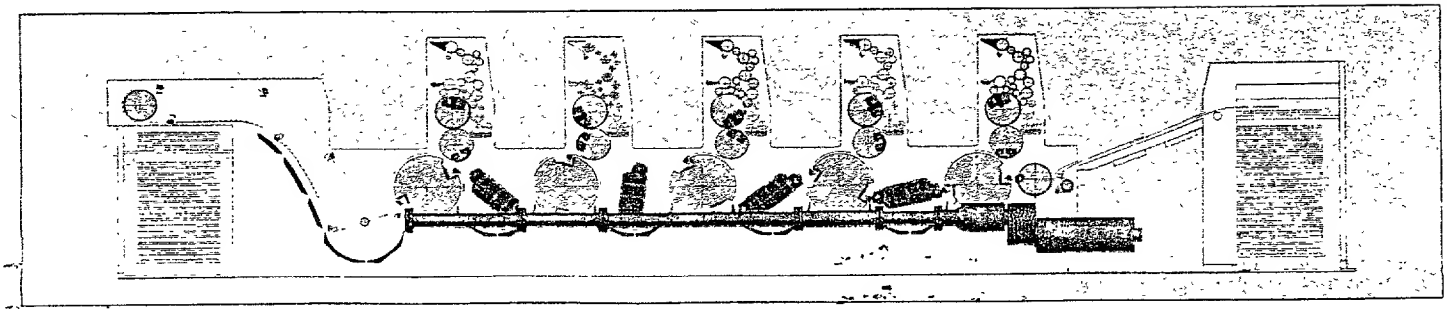
Both the blanket washing device and the ink roller washing device use a minimum of solvent, thus protecting the operating personnel and the environment.



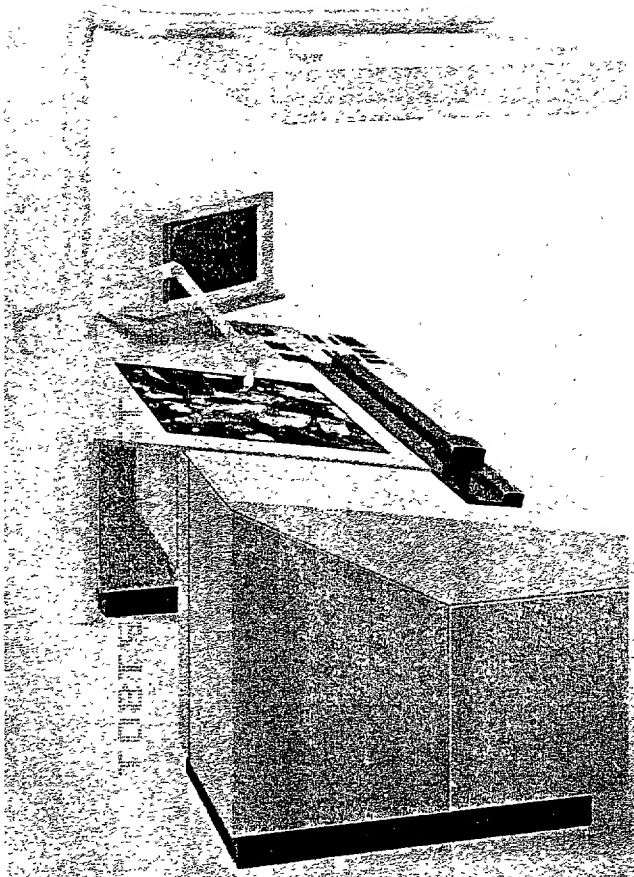


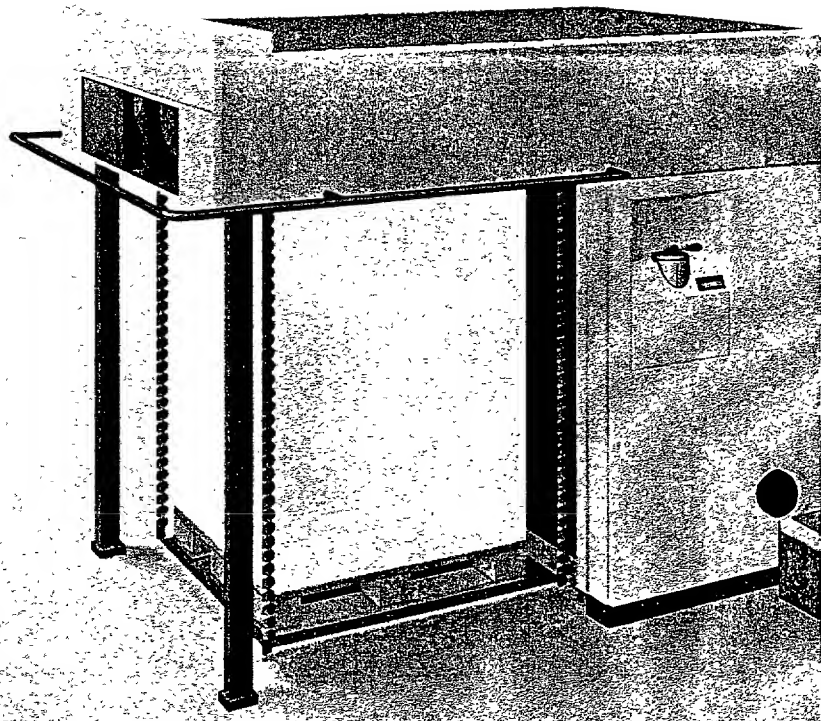
Optimal machine drive by means of distortion-free longitudinal shafts

Particularly with unit design presses, uniform drive to all printing units is of paramount importance. A rigid, distortion-free drive construction incorporating longitudinal shafts guarantees exact register. The smooth running of the Roland 700 is most convincing. Press configurations of up to eight printing units are possible without any difficulty.



Roland 700 at a glance (Status May 1994)





Roland CCI inking regulation system (optional)

Sheet decurler

Non-stop delivery

Light register (optional)

ACD – automatic plate cylinder positioning for plate mounting

Interface to PECOM concept functions – TPP station (optional)

Operation of press functions as well as peripheral units from the PECOM Press Center, operator prompting and diagnostic reporting

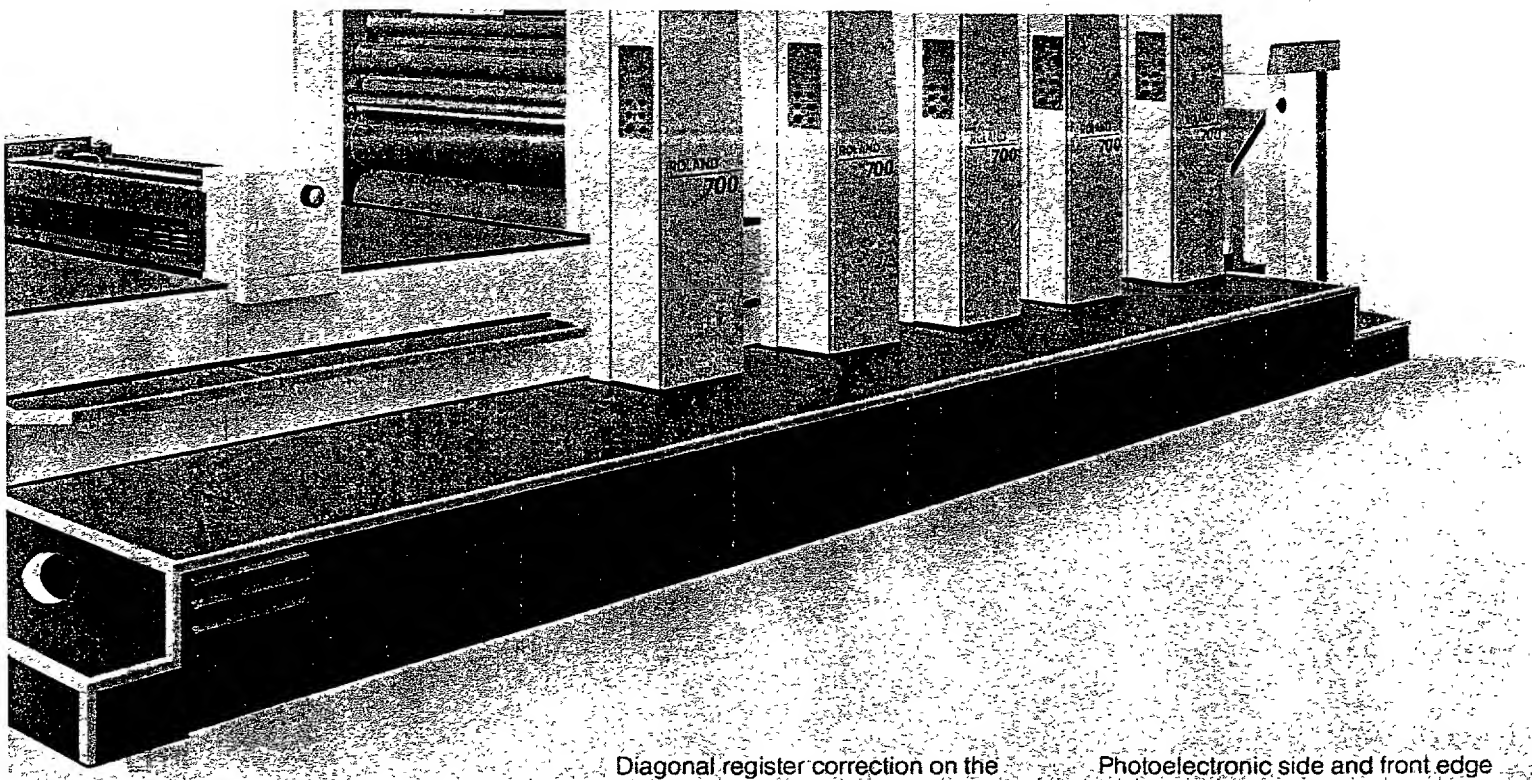
PPL – automatic plate mounting (optional)

ASD – automatic sheet size setting for the delivery and the powder sprayer

Data bank for up to 5.000 orders in the Press Center as standard equipment

APL – automatic plate changing (optional)

Roland RCI inking control system



Diagonal register correction on the run possible

Photoelectronic side and front edge control with trend display

RQM – register control and regulation (optional)

ARD – inking roller washing device

Lateral pile edge control for automatic adjustment of the pile carrier plate

One or two coating modules with transfer module and extension (optional)

Individual and joint setting of contact between forme inkers and the plate

ASD – automatic sheet size setting for the feeder and the pneumatic sidelay

Oscillation timing – setting on the run possible

ABD – blanket washing device

Electromechanical double sheet detector

Stepless adjustment of ink forme roller oscillation on the run

Film dampener for separate or integrated dampening, including Delta effect

Diagonal setting of frontlays, with external individual adjustment

APD – automatic pressure setting between blanket and impression cylinder

Quick-action blanket tensioning

Height setting of lay covers

Pneumatic sidelay

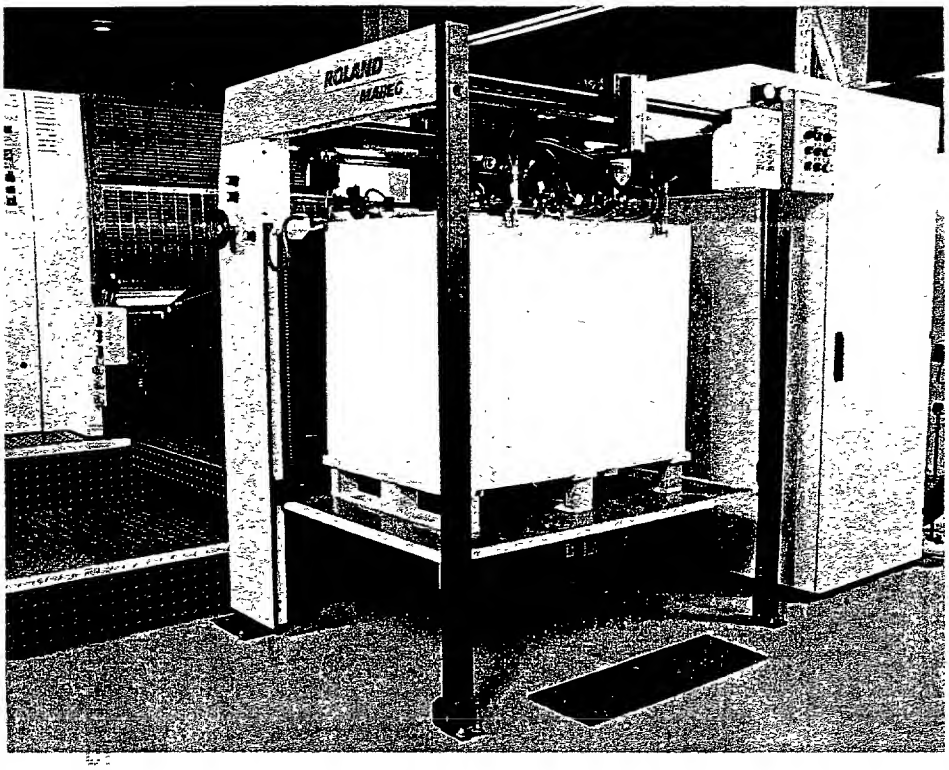
Non-stop feeder

Transferter for smear-free sheet transfer

Perfecting system (optional)

Suction feedboard

The Roland 700 from feeder to delivery



Non-stop feeder with ASD
(**A**utomatic **S**ize positioning **D**evice)

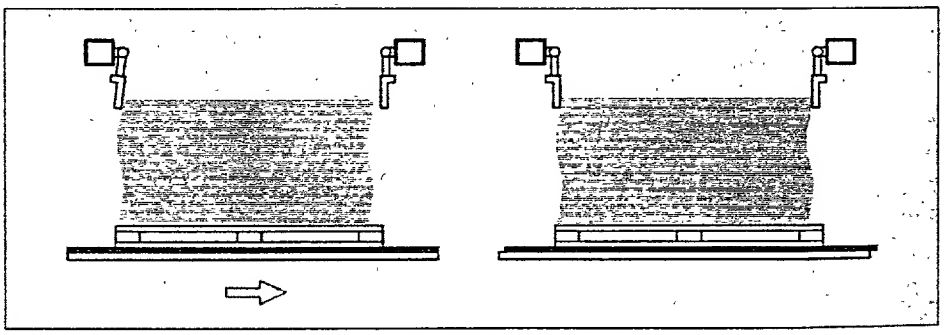
The Roland 700 is equipped with the proven Mabeg non-stop feeder, which includes a motor-driven automatic lateral pile correction facility and a pre-stacking device. Automatic size setting is standard equipment. The sheet dimensions are input at the PECOM Press Center and the lateral pile guide position is then set automatically. The delivery and sidelay settings are coupled with the feeder settings and follow automatically.

Advantage:
- considerable reduction of makeready time by the elimination of many manual tasks.

Pile plate in the feeder

Piles can be loaded into the feeder on the pallettes they are delivered on, it is not necessary to transfer them to press pallettes. The pile plate is suitable for all types of pallettes. A lateral pile edge monitoring system is provided as standard equipment, which automatically adjusts the pile position if necessary. This ensures an identical pulling distance at the pneumatic sidelay for all sheets. Lateral corrections can also be made directly at the feeder by push button. An automatic centering device on the carrier plate prevents loading mistakes.

Advantages:
- considerable work reduction and time saving during feeder loading.
- elimination of lateral register differences.



Improved pile control

A new monitoring system provides optimal pile control on the Roland 700.

The pile height was previously monitored and adjusted by means of a pressure foot located at the rear edge of the pile. Sometimes the front edge of the pile was not optiomally set to the frontplates. An additional sensor at the pile front edge now ensures trouble-free feeding.

Advantages:
- optimal monitoring and adjustment of the pile height ensures uninterrupted feeding.
- stoppages are avoided, waste is reduced, net performance is increased.
- the printer is relieved of the monitoring task at the feeder.

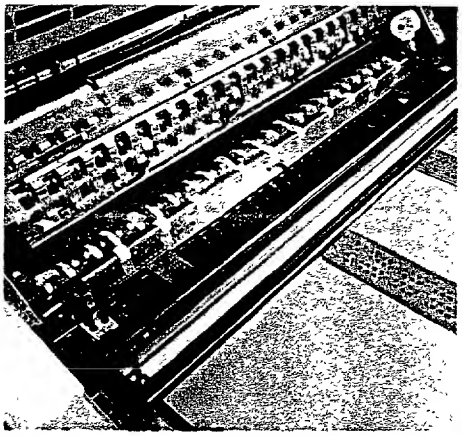
Suction feedboard

Instead of a multitude of wheels and brushes as with conventional stream feeders, sheet transport on the Roland 700 is effected solely by suction tapes recessed in the feedboard which transport the sheet to the infeed area. There is no resetting necessary when changing sizes. The suction feedboard ensures troublefree sheet transport from the pile to the frontlays.

No wheels or brushes means no risk of smearing or marking on a second sheet pass. There is no risk of sheet deformation because the suction tapes are recessed and have the same level as the feedboard surface.

Suction rollers help to bring the sheet securely to the frontlays. From thin paper to thick carton, the suction feedboard can handle a wide variety of substrates.

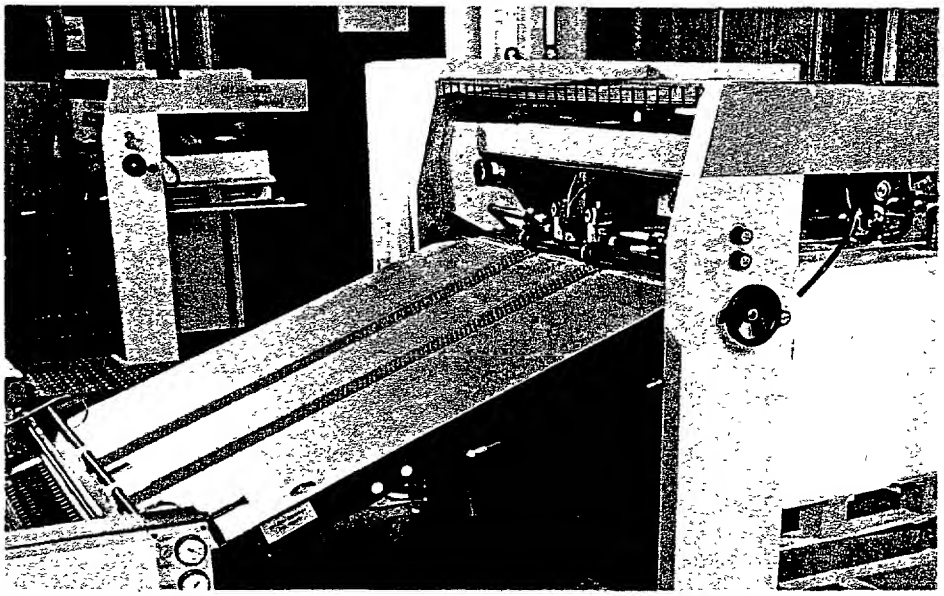
Advantage:
- considerable makeready time savings and an increase in production reliability.

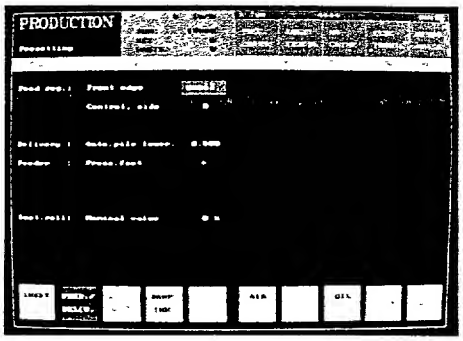


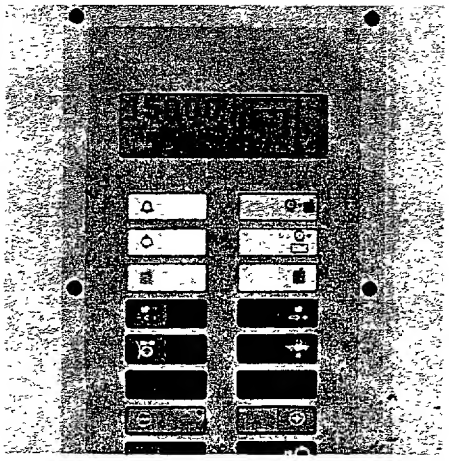
Blast/suction elements in the infeed plate

The air stream from the blast/suction elements creates an underpressure which stabilises the sheet front edge at the infeed.

Advantage:
- stocks which tend to have a wavy front edge are brought securely under the lay covers.



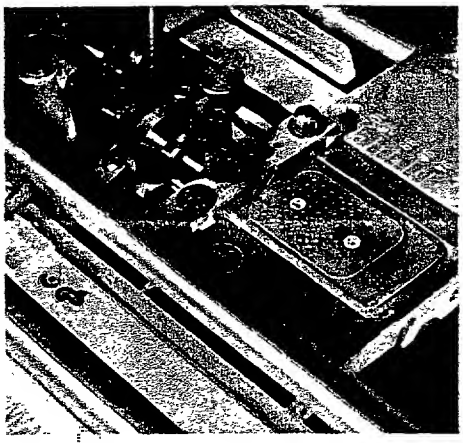




Side edge control and trend display

The sheet is permanently monitored by a computer-supported trend display. Diagonal, early or late sheets are recognised and optically indicated in a display located at the first printing unit. The display informs the operator of the feeder condition and he can intervene accurately, thus ensuring a more reliable infeed.

Advantages:
- reduction of stoppages and startup waste.
- high print quality is maintained.
- higher productivity.



Pregripper from below

The pregripper operating from below takes the sheet after the laying process, accelerates it up to machine speed and transfers it to an infeed drum. A force-controlled cam/lever mechanism ensures reliable and accurate transfer even at the maximum speed of 15.000 sheets per hour.

Advantage:
- through optimisation of the mechanical motion, acceleration of the sheet has been greatly reduced.

Infeed barrier

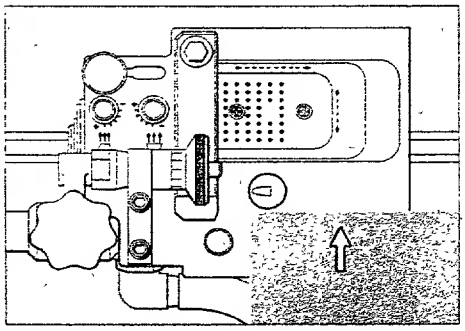
Blocking of the frontlays, the lay covers and the pregripper reliably prevents early or diagonal sheets from entering the press.

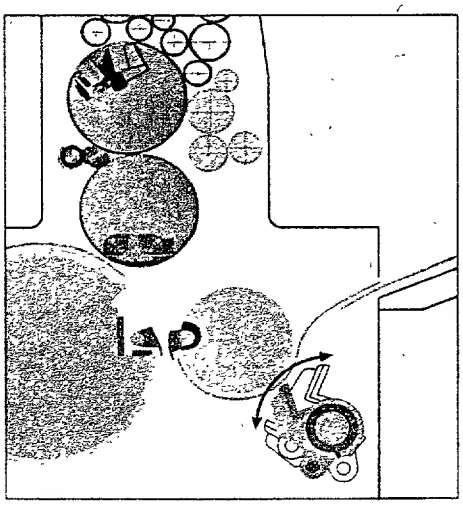
Advantage:
- a high degree of press safety.

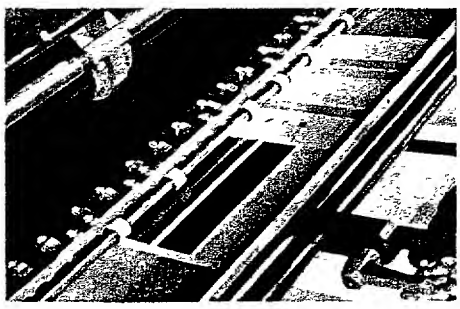
Pneumatic sidelays

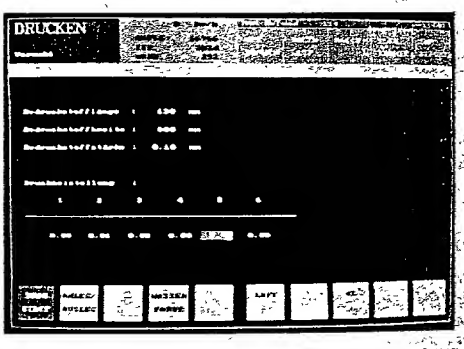
Like all MAN Roland presses, the Roland 700 is equipped with the patented pneumatic sidelays which have many advantages that contribute to high production reliability. No pulling roller means no risk of sheet damage. Pulling from below the sheet means more time for front and lateral sheet alignment. When changing sheet sizes, makeready time is reduced. On the Roland 700, the sidelay adjustment is made simply by inputting the sheet size at the PECOM Press Center. The pneumatically controlled sidelays have a long service life, in part due to the hardened sheet stop face and a ceramic-coated suction plate.

Advantages:
- high production reliability.
- shorter makeready times.









APD (**A**utomatic printing **P**ressure adjustment **D**evice)

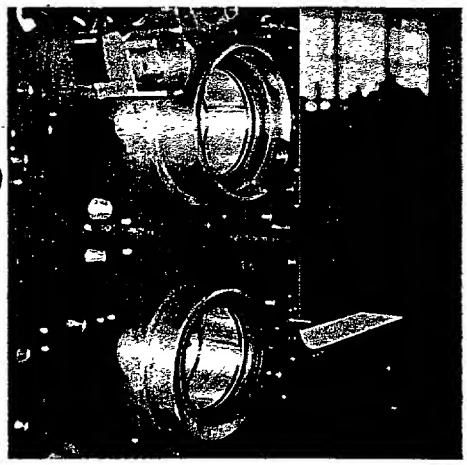
Adjustment of the pressure between the blanket and impression cylinders according to the stock to be run is done from the PECOM Press Center. It is possible to set each individual unit to a different setting.

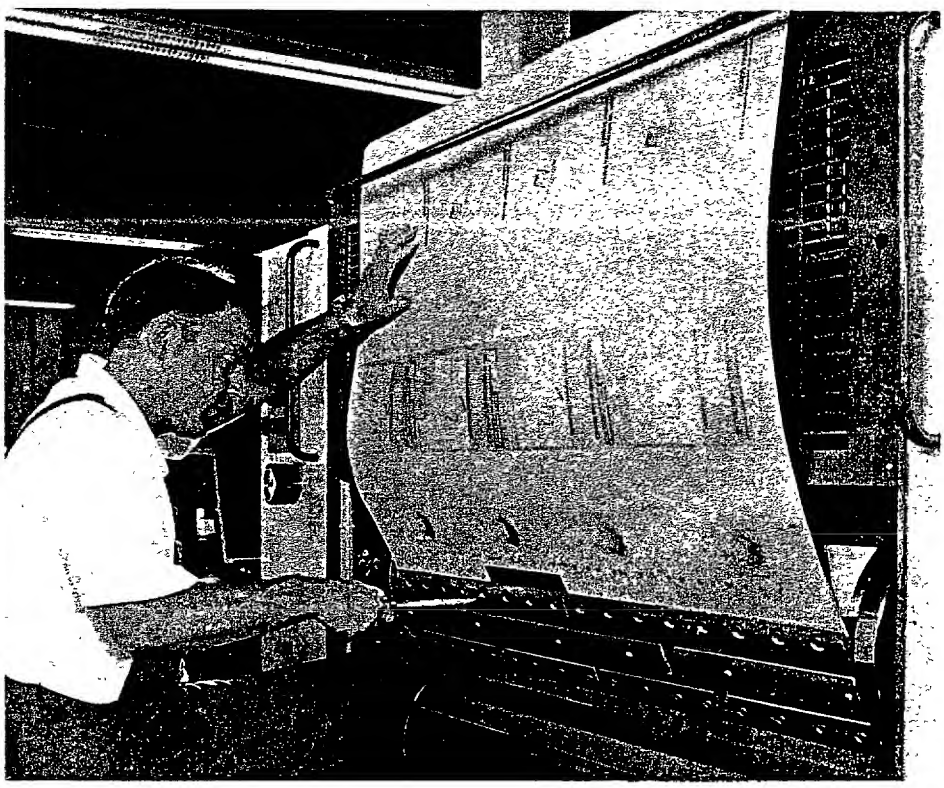
Advantage:
- reduction of walking distance and shorter makeready times.

Cylinders

The plate and blanket cylinders are equipped with sliding bearings. The cylinder bearings revolve inside the bearing shell. Plate, blanket and impression cylinders are surface coated to protect against rust.

Advantage:
- the pressure-absorbing cylinder bearings permit operation with or without bearer contact.





ACD (**A**utomatic **C**ylinder setting **D**evice)

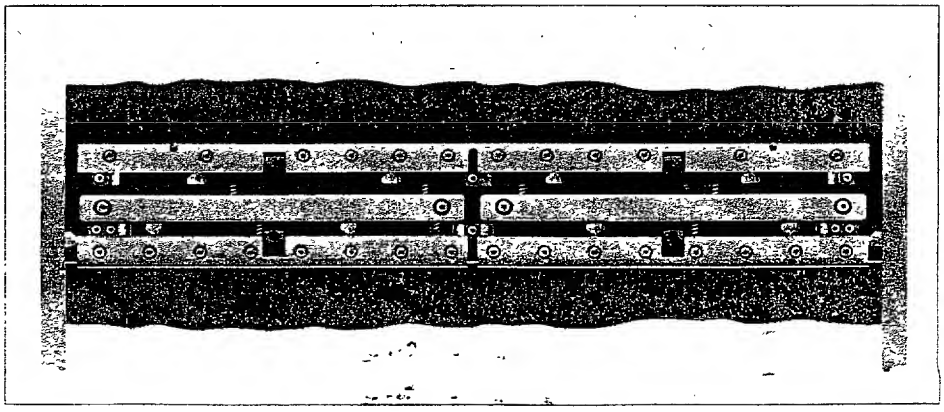
Automatic cylinder positioning for fast plate changing. At the push of a button, the plate cylinders automatically revolve to the optimal position for plate mounting.

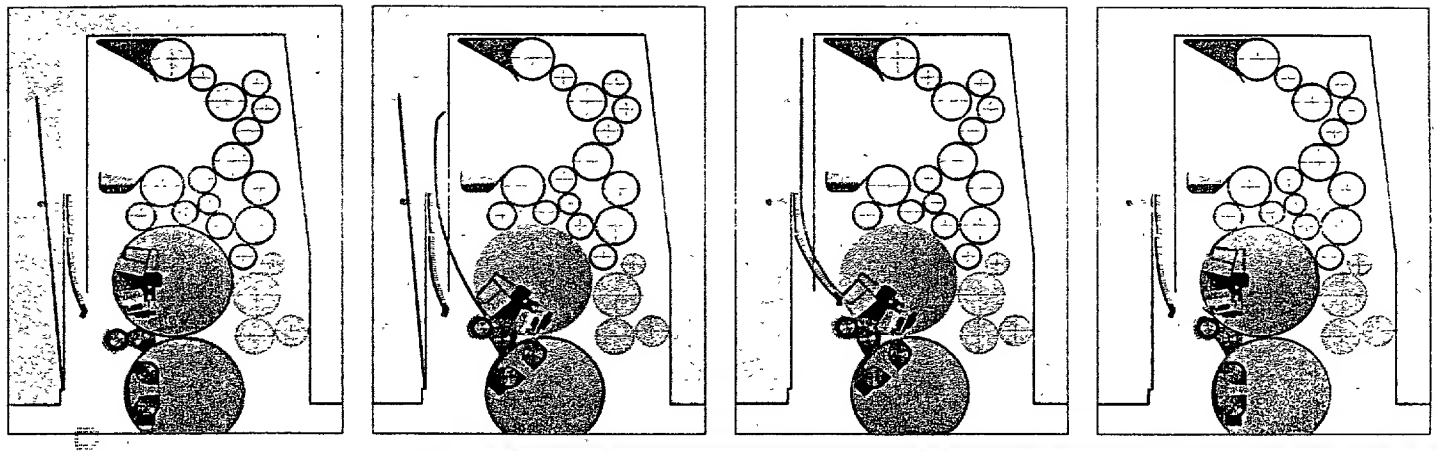
Advantage:
- time-consuming inching is eliminated.

Register system

The Roland 700 is equipped with a register system in the plate clamps which includes centre positioning and a zero notch.

Advantages:
- exact location of the plate laterally through the centre positioning and circumferentially through the zero notch
- reduction of makeready time



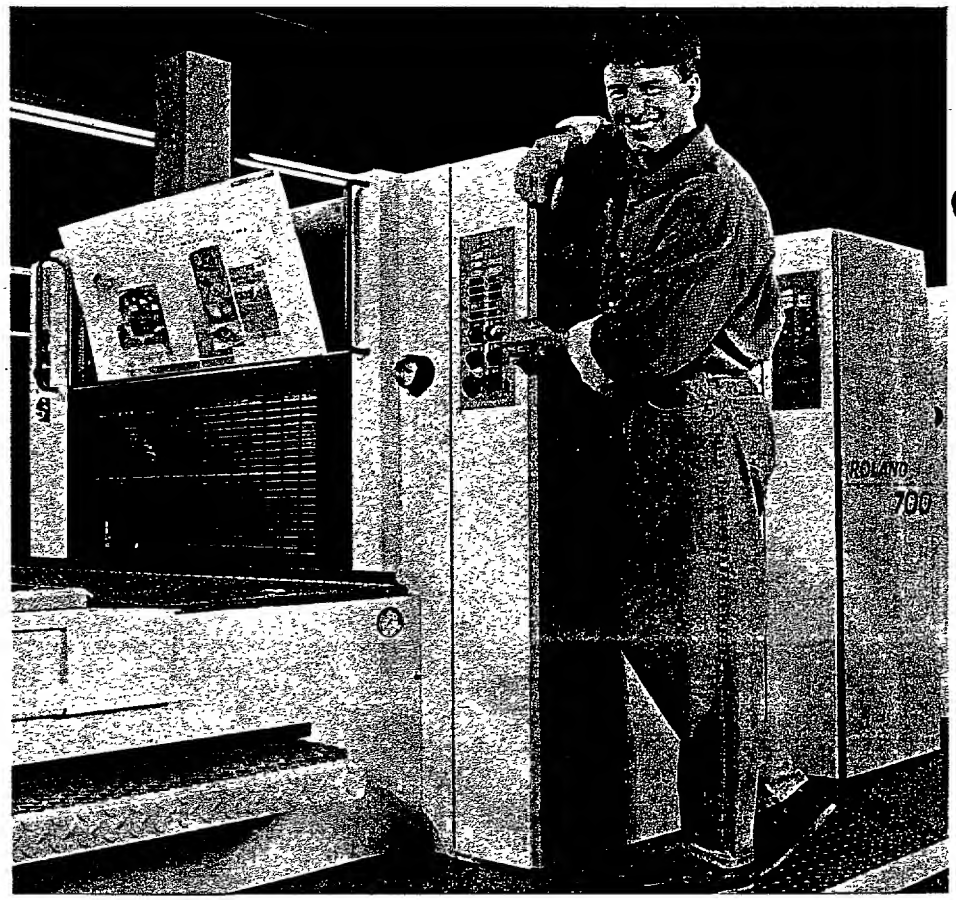


PPL (**P**ower **P**late **L**oading) and **APL** (**A**utomatic **P**late **L**oading) Automatic plate mounting and automatic plate changing.

PPL is an automatic plate mounting system (optional) which reduces the time needed for plate changing to less than one minute per printing unit and also increases operating comfort. Both used plates or new plates with straight edges can be used.

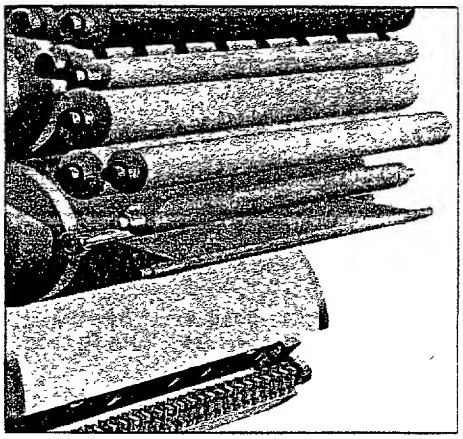
APL is an automatic plate changing system that enables plates to be changed without any manual steps. Just like PPL, APL provides highly accurate register.

When printing certain grades of paper it may be necessary to make fit corrections. With both APL and PPL it is possible to stretch the end of the plate laterally and circumferentially to compensate for dimensional changes in the stock. This is facilitated by the design of the rear plate clamp which is divided into seven segments.



Quick-action plate clamping and tensioning

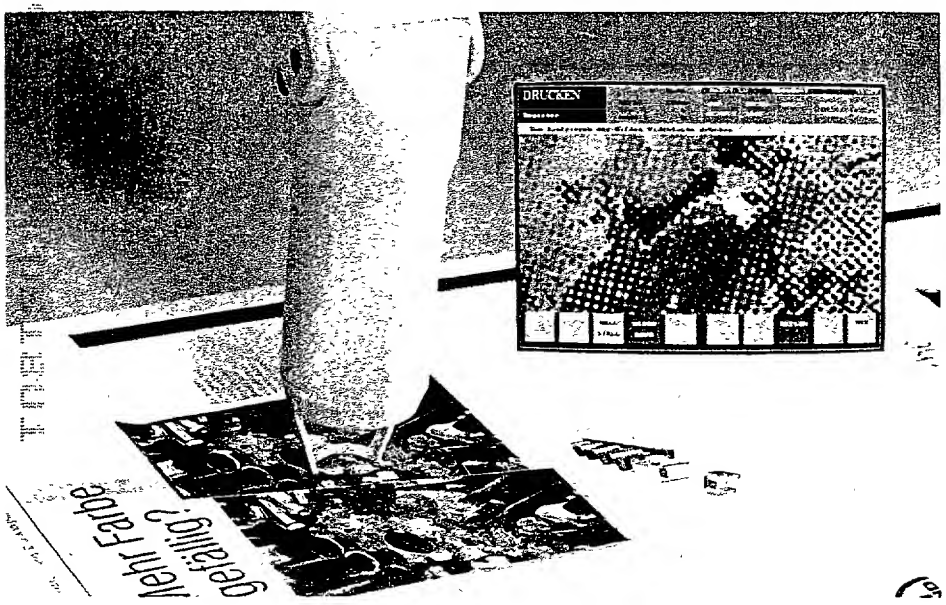
This device offers fast and accurate mounting of plates on the plate cylinder. The design of the clamp ensures that the plate is not distorted through tensioning. Only one setting screw provides even and parallel tensioning across the entire width of the plate. This prevents distortion.

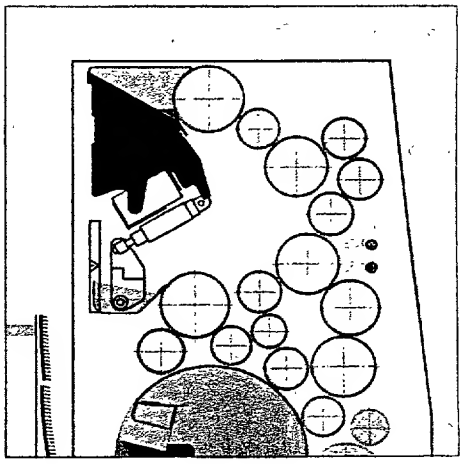


ABD (**A**utomatic **B**lanket Cylinder washing **D**evice)

A blanket washing device is standard equipment and relieves the printer of the tiresome and time-consuming task of washing blankets. A variety of washing programmes can be defined to suit varying cleaning requirements.

Advantage:
- relief from unpleasant tasks, increase in production reliability.





RQM (**R**egister and **Q**uality **M**agnifier) Register control and regulation

The optional RQM register regulation represents an extension of the plate cylinder remote register control. Either register crosses, or picture segments enlarged 50 times, can be displayed on the Press Center monitor and used to correct register.

The printer selects a picture detail (e.g. a register cross) from one of the colours and displays this on the monitor as his reference point. The identical picture details, or register crosses, of the other process colours or special colours which are not yet in register to the reference point are allocated to the respective printing units. The deviation from the reference point is automatically calculated and, by pushing the regulation key, circumferential and lateral register correction is effected.

Diagonal register

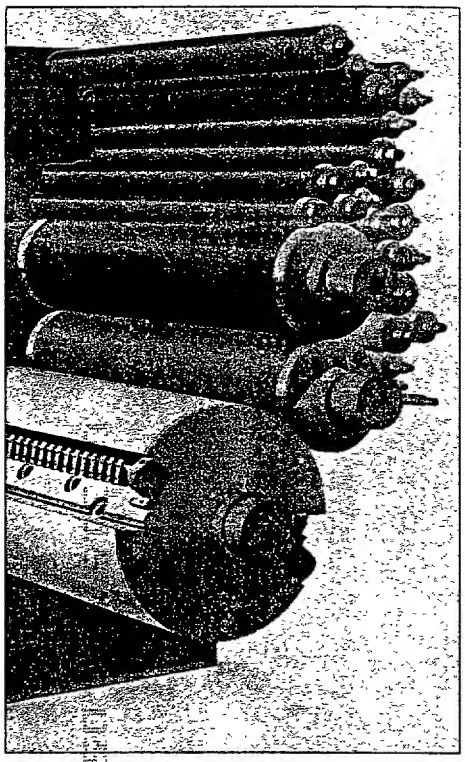
With this diagonal register control, even diagonal register corrections can now be carried out on the run.

Advantage:
- startup waste is reduced.

ARD (**A**utomatic **R**oller washing **D**evice)

This device features comfortable operation from the PECOM Press Center. As with the blanket washing device, a variety of washing programmes can be defined and implemented.

Advantage:
- reduction of makeready times, relief from unpleasant tasks.



New computer-optimised inking unit

To meet the wide variety of demands placed on a modern inking unit, computer simulation and extensive practical tests were made to determine the optimal roller geometry. Compared to systems in use up until now, a very considerable improvement has been achieved.

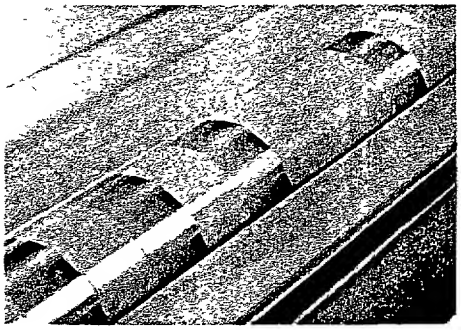
With subjects that tend toward ghosting, the oscillating forme inkers help a great deal in overcoming this problem. All four, or only the first three if so wished, are equipped with steplessly adjustable oscillating play which can be set from outside the inking unit.

All inking rollers are easily accessible and can be exchanged very simply.

When changes are made to the plate packing or to the impression setting, the four forme inkers can be jointly reset, quickly and easily, by means of a central setting. In the case of a change to the pressure between the plate and blanket cylinders, the forme inkers are reset automatically. This ensures permanently correct settings.

The Roland 700 has a remote control setting for ink oscillation timing as standard equipment. Ink fade in the printing direction can be counteracted by altering the setting of the oscillation timing on the run. This adjustment is made from the PECOM Press Center, and it is particularly important when printing multiple-up formes.

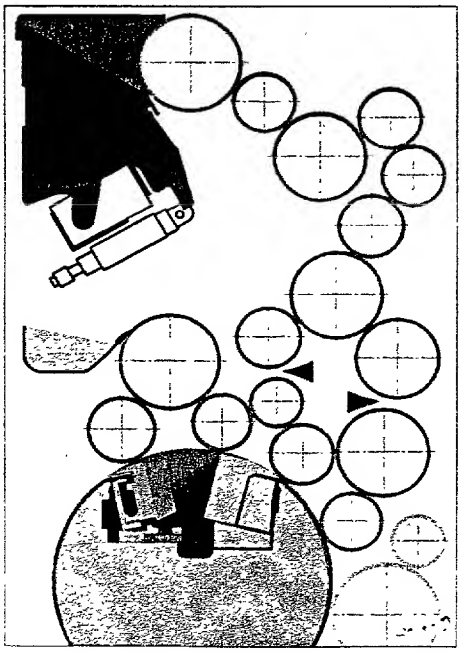
Advantage.
- setting is faster and easier. This brings shorter makeready, reduced waste and significant quality improvements.



Programme-controlled sequence switching and ink unit separation

The forme inking rollers are in contact to the plate several revolutions before printing commences. The forme is pre-inked, allowing the normal inking level to be reached much faster. The ink unit separation prevents the loss of the ink profile during a production stop. On resuming the run, the ink/water balance is achieved faster.

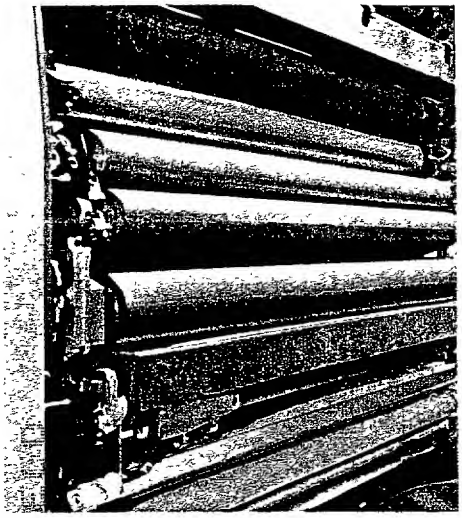
Advantages:
- the time required for colour balancing is reduced.
- less startup waste.



Roland RCI inking control as standard, Roland CCI inking regulation optional

With the Roland RCI inking control integrated in the PECOM Press Center, the metering elements (ink slides) in the ink fountain can be quickly and easily set to 250 exactly defined setting positions to match the ink profile of the subject to be printed. Roland CCI (optional) provides automatic regulation of ink feeding. The digital signals for changing the ink slide settings are via fibre optics and are transmitted simultaneously. This means that colour corrections with the CCI system are carried out in a fraction of the time previously necessary.

Advantage:
- higher print quality, increased production reliability.



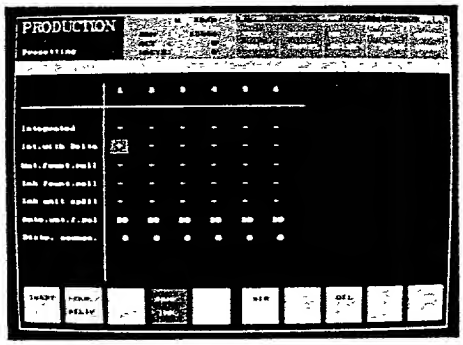
A newly-developed film dampener with Delta effect

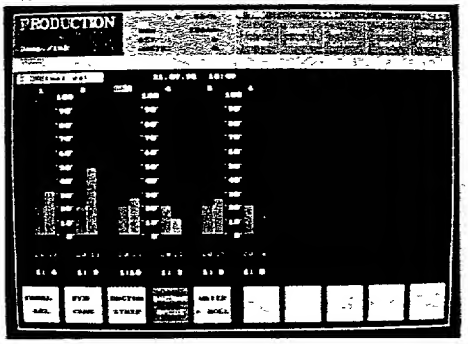
The Roland 700 is equipped with the new Roland Deltamatic dampener, which incorporates all the knowledge and experience available from modern film dampening systems. This includes an integration facility, whereby the dampener can be connected to the inking unit via a bridge roller. Under certain conditions this gives faster achievement of the ink/water balance. This gives the printer expanded possibilities to alter the dampener to suit individual job requirements.

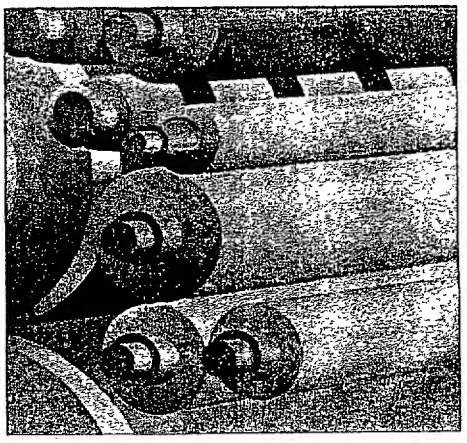
The Delta effect is implemented from the PECOM Press Center. A reduction in the circumferential speed of the plate dampener gives a cleansing effect which removes particles from the printing plate.

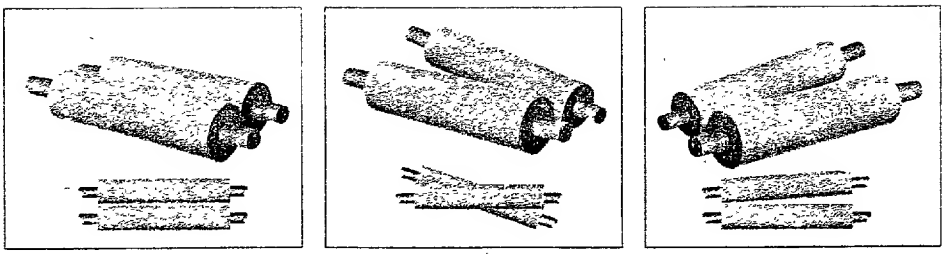
Advantage:
- better print quality with stocks that tend to pick. Less waste.

When printing formes that tend to ghost, when using metal inks or when printing formes with a low ink consumption, the printer can work with separated inking and dampening units. The setting for integrated or separated modes is made from the PECOM Press Center.









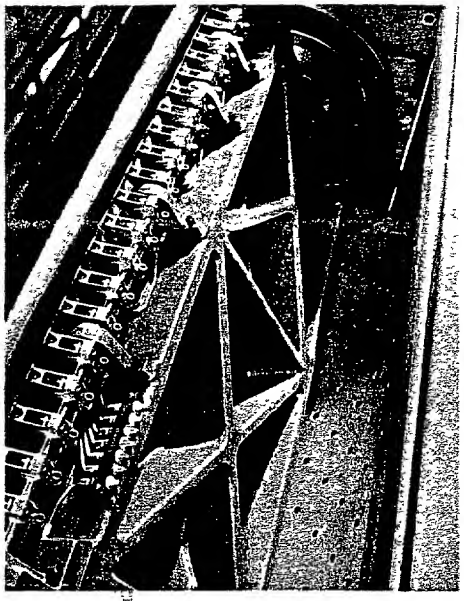
Diagonal setting of the metering roller

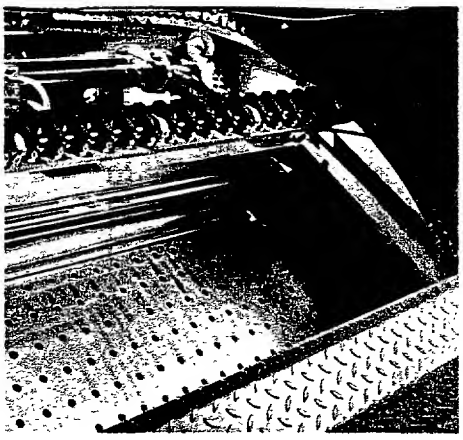
The diagonal setting possibility permits an even more exact control of the amount of solution

Washing of the dampening unit

The dampening units are washed together with the inking units. By means of the automatic roller washing device, all inking and dampening rollers can be washed at the same time

Advantages:
- shorter washing times
- less work.



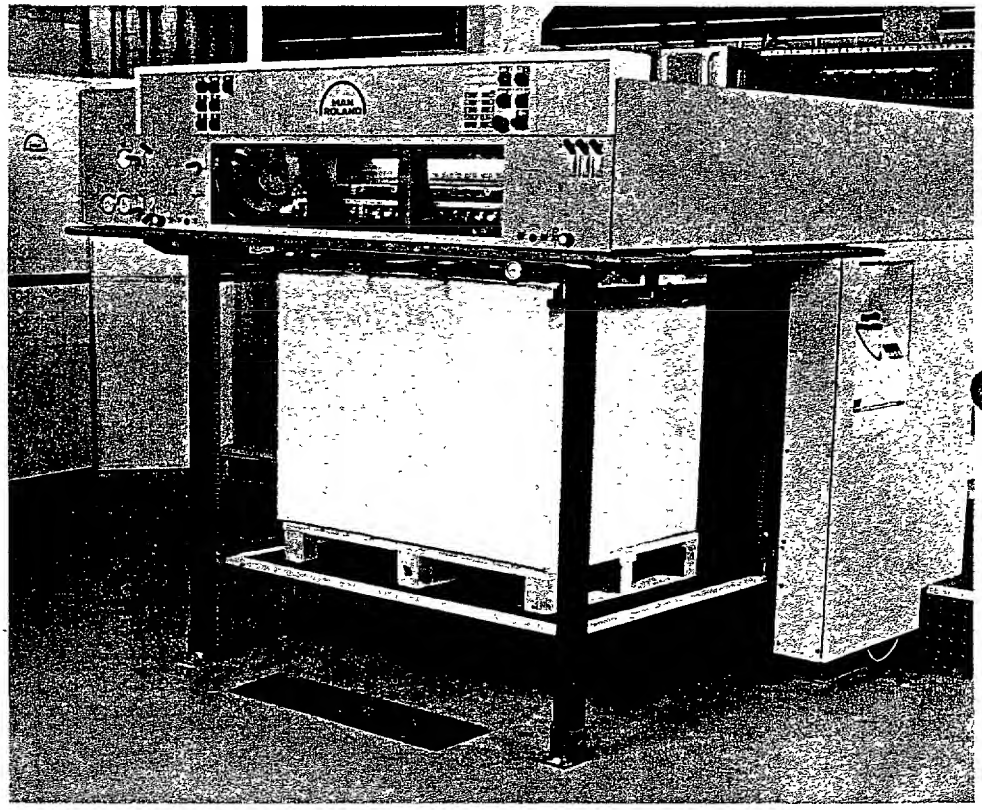


Sheet transfer

Transfer between the printing units is by means of a double diameter Transferter. Steplessly adjustable sheet guiding tracks are located below the Transferter.

Sheet brakes

The revolution speed of the suction roller in the sheet braking system is speed-compensated. This ensures secure deceleration of the sheet even at varying speeds.



Sheet transport into the delivery

The sheet is passed from the impression cylinder in the last printing unit into the delivery via a delivery drum also of double diameter. Transfer does not commence until the sheet is fully printed, even with sheets of maximum size.

The sheet is transported into the delivery over an enclosed sheet guiding track which is divided into four segments. Steplessly adjustable air regulation from maximum suction to maximum blast ensures problem-free sheet travel.

Advantages:
- high production reliability through flutter-free sheet transport.
- reduced noise is better for the working environment.
- no adjustment necessary for different sheet sizes

Non-stop delivery

The non-stop delivery with pile carrier plate also contributes to high productivity. Pile changes can be made without interrrupting production. The pile carrier plate makes pile changing faster and permits the use of pallettes of varying sizes.

Advantage:
- increased productivity

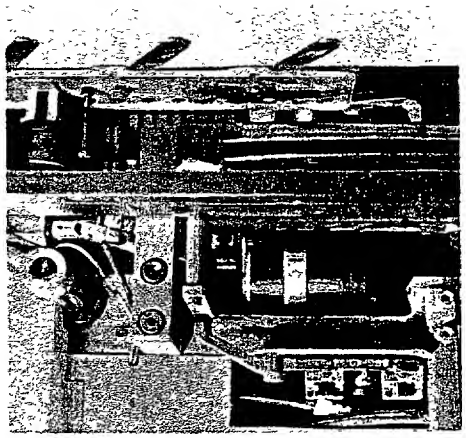
Pneumatic inspection sheet removal

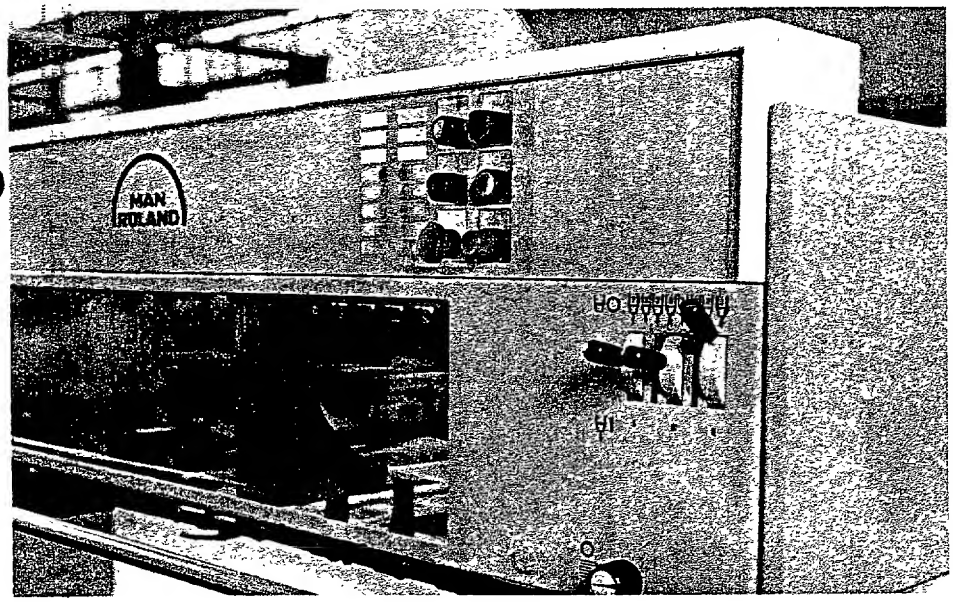
Safe sheet removal is ensured even at high speeds because a pneumatically controlled device maintains a safe distance between the sheet to be removed and the continuing production. This prevents stoppages caused by faulty operation.

Shadow-reduced gripper system in the delivery

This is especially important when printing with UV inks, permitting shadow-free exposure of the UV inks to the polymerising light

Advantage:
- no delivery modification necessary for fitting of a UV dryer.





ASD (**A**utomatic **S**ize positioning **D**evice)

Sheet size settings for the delivery automatically follow the settings made for the feeder.

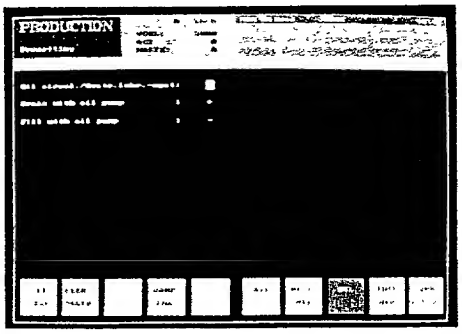
Powder spray length setting

By inputting the sheet size at the PECOM Press Center, the spray length setting is automatically made.

Blast air in the delivery

The blast air in the delivery is precisely directed. In addition, the air is extracted from under the oncoming sheet. This ensures safe and secure sheet deposit Piling control is improved, the slow air extraction avoids sheet flutter.

Advantage:
- the very high maximum speed is possible even with light grades of paper.

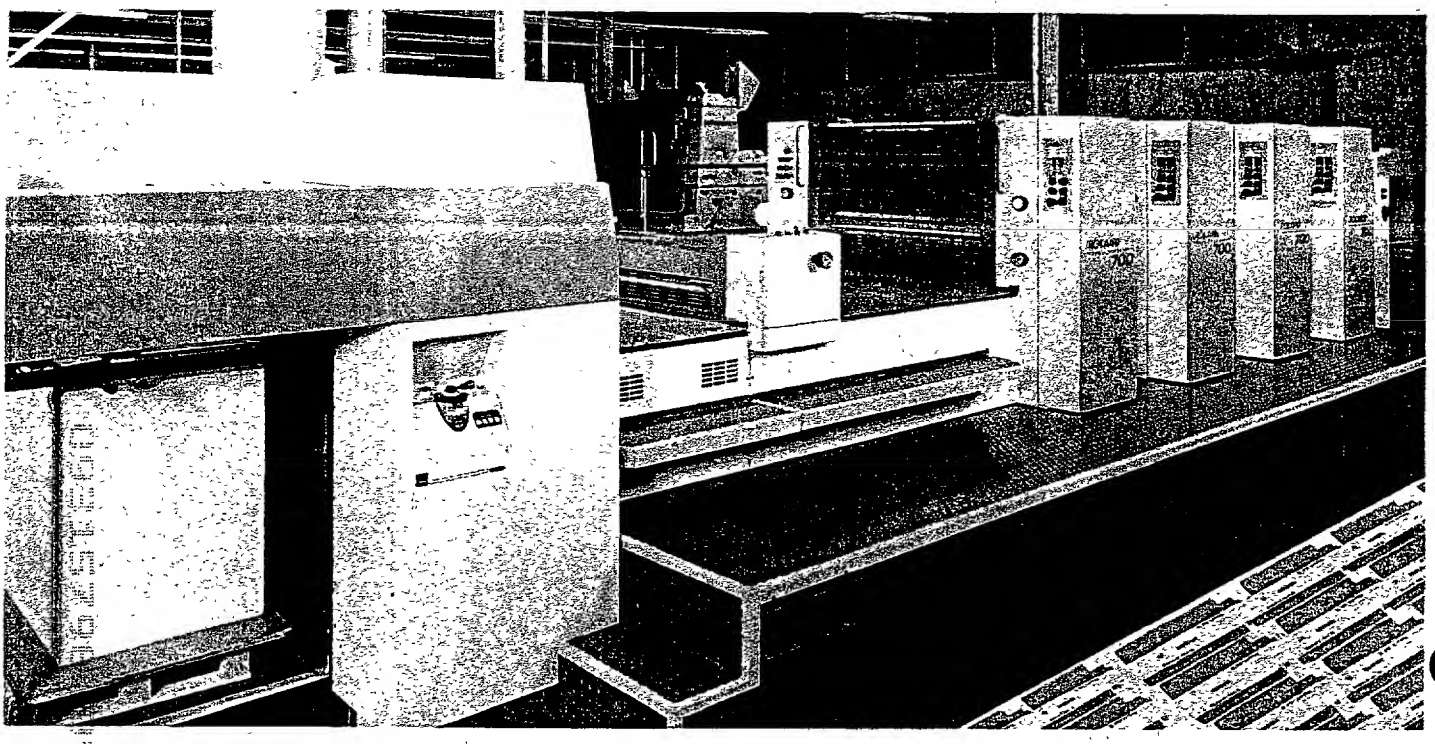


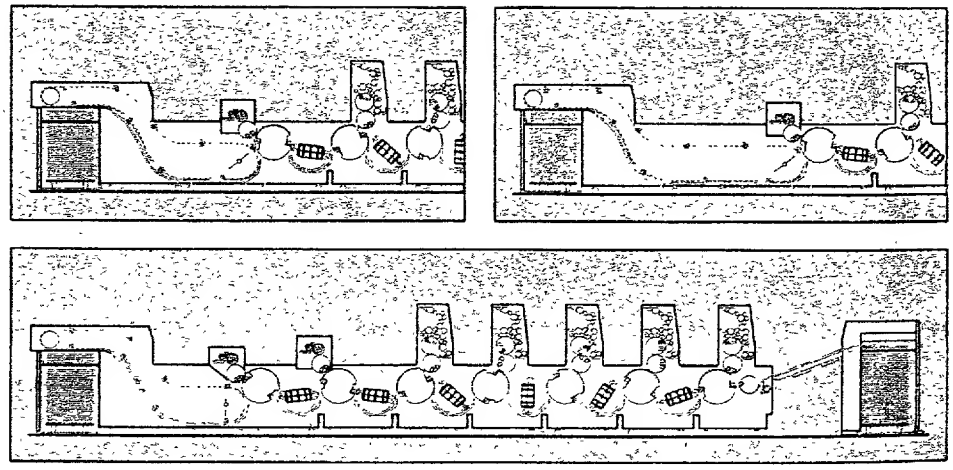
Central lubrication

Central lubrication reduces the time necessary for maintenance to a minimum. The oil change for all printing units is centrally done by means of an oil drainage screw with a pump.

Advantage:
- increase in efficiency and additional machine safety.

Coating – because today printing alone is no longer enough





A coating module for economical in-line enhancement

In many cases, the in-line coating systems from MAN Roland can save expensive separate processing involving separate equipment and manpower. The economic advantages: faster order processing by printing and coating together, lower production costs meaning more competitive pricing, and a lower space requirement. Intermediate storage of material requiring further processing is eliminated.

A transfer module is integrated between the last printing unit and the coating module. This increases the time between the last application of ink and the application of coating, meaning that the coating is applied to a relatively dry ink layer. This is an important requirement for higher gloss. Additionally, the transfer module provides space for the installation of UV intermediate dryers when UV inks and UV coatings are to be used. An extension module (optional) can be located between the coating module and the delivery. This increases the drying length and is an important advantage when thick coating layers are required.

Technical Data (mm)

MAN ROLAND

Roland 700

Model	Number o printing units	Sheets/hour maximum	Sheet sizes maximum mm	Sheet sizes minimum mm[1]	Printing area maximum mm	Machine dimensions length x width x height mm[3]			Pile height[4] feeder mm	Pile height[4] delivery mm
Roland 700										
R 702 3B	2	15,000	740x1,040	340x480	715x1,020[2]	7,213	3,450	2,140	1,180	1,080
R 703 3B	3	15,000	740x1,040	340x480	715x1,020[2]	8,393	3,450	2,140	1,180	1,080
R 704 3B	4	15,000	740x1,040	340x480	715x1,020[2]	9,573	3,450	2,140	1,180	1,080
R 705 3B	5	15,000	740x1,040	340x480	715x1,020[2]	10,753	3,450	2,140	1,180	1,080
R 706 3B	6	15,000	740x1,040	340x480	715x1,020[2]	11,933	3,450	2,140	1,180	1,080
R 707 3B	7	15,000	740x1,040	340x480	715x1,020[2]	13,113	3,450	2,140	1,180	1,080
R 708 3B	8	15,000	740x1,040	340x480	715x1,020[2]	14,293	3,450	2,140	1,180	1,080
Roland 700 with transfer module and coating module										
R 702 3B TL	2	15,000	740x1,040	340x480	715x1,020[2]	9,338	3,450	2,140	1,180	1,080
R 703 3B TL	3	15,000	740x1,040	340x480	715x1,020[2]	10,518	3,450	2,140	1,180	1,080
R 704 3B TL	4	15,000	740x1,040	340x480	715x1,020[2]	11,698	3,450	2,140	1,180	1,080
R 705 3B TL	5	15,000	740x1,040	340x480	715x1,020[2]	12,878	3,450	2,140	1,180	1,080
R 706 3B TL	6	15,000	740x1,040	340x480	715x1,020[2]	14,058	3,450	2,140	1,180	1,080
R 707 3B TL	7	15,000	740x1,040	340x480	715x1,020[2]	15,238	3,450	2,140	1,180	1,080
R 708 3B TL	8	15,000	740x1,040	340x480	715x1,020[2]	16,418	3,450	2,140	1,180	1,080
Roland 700 – convertible multicolour/perfecting machines										
R 702 3B	2	11,000[5]	720x1,040	340x480	700x1,020	7,213	3,450	2,140	1,180	1,080
R 703 3B	3	11,000[5]	720x1,040	340x480	700x1,020	8,393	3,450	2,140	1,180	1,080
R 704 3B	4	11,000[5]	720x1,040	340x480	700x1,020	9,573	3,450	2,140	1,180	1,080
R 705 3B	5	11,000[5]	720x1,040	340x480	700x1,020	10,753	3,450	2,140	1,180	1,080
R 706 3B	6	11,000[5]	720x1,040	340x480	700x1,020	11,933	3,450	2,140	1,180	1,080
R 707 3B	7	11,000[5]	720x1,040	340x480	700x1,020	13,113	3,450	2,140	1,180	1,080
R 708 3B	8	11,000[5]	720x1,040	340x480	700x1,020	14,293	3,450	2,140	1,180	1,080

TL = Transfer and coating modules of standard length Other configurations and additional extension (V) on request
The TLV version is 914 mm longer than the TL version

[1] Standard minimum size, smaller available on request

[2] The maximum image area is 730x1040 mm on request

[3] The machine dimension given above apply to the standard versions Please refer to the respective press installation plans for binding dimensions

[4] Pile heights apply to standard configurations. With presses on 300 mm or 600 mm raised foundations, the pile heights increase by 300 mm or 600 mm

[5] 15,000 sheets per hour in straight printing mode.

MAN Roland
Druckmaschinen AG

Sheetfed Press Division
PO Box 101264
D-63012 Offenbach am Main
Germany
Telephone + 49 69 83 05-0
Telex 4 152 852 mro d
Fax + 49 69 83 05-14 40

The Roland 700 – A model of...

Efficiency

- A press for high-volume printing production.
- High net speeds with short makeready times achieved through sensible automation.
- Variable in application with all substrates, leading to a high degree of utilisation and consequently to increased profitability.
- New dimensions in efficiency through Console technology and the possibility of system integration into the PECOM process electronic concept.

Quality

- The design – double diameter impression cylinders and Transferters – as well as the press drive principle ensures perfect register with few sheet transfers and minimal sheet bending.
- Roland RCI inking control system as standard equipment, highest quality (with protocol recording) with the optional Roland CCI inking regulation system.
- Centralised operation from the PECOM Press Center permits full concentration on quality.

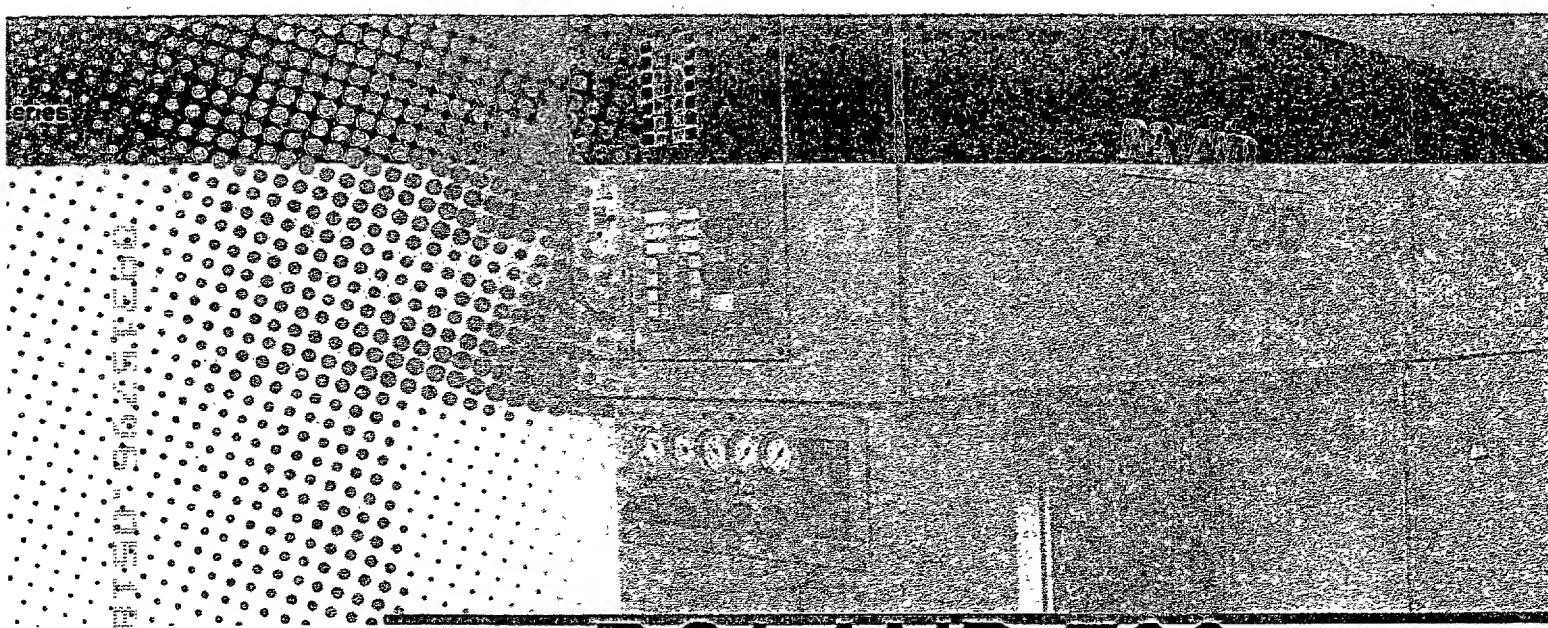
Reliable production

- Increased production reliability through decentralised electronics and digital signal transmission via fibre optics, operating condition reporting and a diagnostic system.

402.1140 Printed in the Federal Republic of Germany (english)

MAN ROLAND

Profitability by Design.



ROLAND 700.

The all-round press in medium format (74/104).

ROLAND 700: Example for maximum performance.

The standardized and highly-automated ROLAND 700 has stood the test in sheet-fed offset printing excellently - which has been impressively proven by more than 10,000 installed printing units. Innovative technology, in conjunction with high productivity and efficiency, make the digitally controlled machine a standard in the medium size and other format classes.

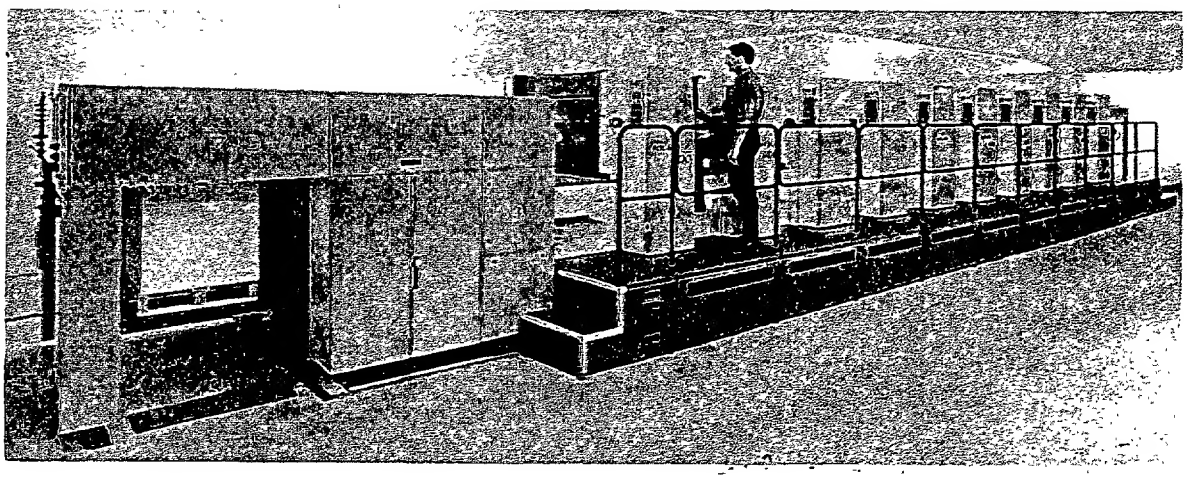
As a universal system, the ROLAND 700 can process all stocks between a thickness of 0.04 and 1.0 millimetres, from paper and carton to special materials, at a maximum speed of 15,000 sheets per hour in face printing and 12,000 in face and back printing. Above all, the sophisticated design of the sheet guide, printing unit, as well as the ink and damping unit, is responsible for the constantly high printing quality provided by the ROLAND 700. Highest precision and reliability of production is offered by the reversing technology with its advantageous single-drum reversal. Also magnificent is the state-of-the-art enhancement system with the Roland Seccomatic dryer for a demanding printing production.

The additional integration into the leading PECOM process electronic system can combine the ROLAND 700 with the central job preparation, pre-press stages and administration on data level. Thus, the high degree of automation and the ergonomy of the press, with its comprehensive process control, supplement each other to form a trend-setting printing management system.

Thanks to its modular design, the ROLAND 700 can individually be configured, tailor-made for your requirements in commercial, packaging or special printing. With a maximum of ten printing units, up to two perfecting units and a single or double coating module, including an extended delivery, it can master each job structure. Furthermore, the ROLAND 700 can increase its enormous productivity again: by the automatic AUPASYS material logistic system, in particular in packaging printing.

Roland 700 highlights at a glance.

- ❑ Max. 15.000 sheets/h in straight printing/ 12,000 sheets/h in perfecting printing
- ❑ Central control console, can be integrated in the PECOM system
- ❑ Automatic change of formats
- ❑ Automatic adjustment of stock thicknesses
- ❑ Automatic washing systems (blanket cylinders, impression cylinders and ink unit)
- ❑ Plate loading automated (PPL) or automatic (APL) including plate feed control
- ❑ Remotely controllable register settings
- ❑ Printing unit with cylinders in the 7-clock position, transferters
- ❑ Single-drum reversal
- ❑ Optimized ink unit (against gradual fading)
- ❑ Roland Deltamatic damping unit
- ❑ Ink control systems (RCI, CCI)
- ❑ Single or double coating module
- ❑ Roland Seccomatic dryer
- ❑ Integration in the automatic AUPASYS material logistic system
- ❑ Newly designed varnish supply system with a quick change of varnishes
- ❑ AirGlide delivery for top quality



The 10-colour ROLAND700 Top quality and productivity in 5-colour double-sided sheet-fed offset

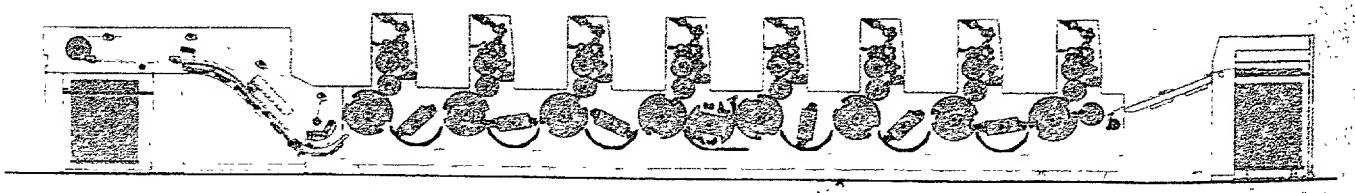
The universal system in commercial and special printing.

The high productivity and the versatility offered by the ROLAND 700 opens up manifold applications in commercial and special printing.

Efficiency does not depend on circulation.
Thanks to its enormously fast job handling, the ROLAND 700 is remarkably efficient. This is achieved by numerous automations and by the central control via the central control console which is integrated in the PECOM process electronic system. In addition to an automatic adjustment of formats and stocks, the ROLAND 700 also provides an automated or an automatic change of plates in a true-to-register manner. The result: shortest makeready times at first-class quality. This allows you to produce even smaller circulations efficiently, such as special editions and posters. And in the case of medium and high circulations, you can profit from the high speed.

Quality is standard.
Excellent printing quality - a matter of fact for the ROLAND 700. Computer-based ink and damping units combine responsiveness and storage volumes ideally, to provide optimum process control. The innovative colour measuring and control technology can reduce the waste, setting high standards. An advantage which will have an effect even on your material costs, especially in the case of high-quality stocks.

Much can be done.
A wide range of stocks in commercial and special printing speaks in favour of the various applications of the ROLAND 700. It can process the thinnest bible printing paper as perfectly as, for example, foils and other special materials, and print stocks up to a thickness of 1.0 mm where "straight printing presses" are used.



The ROLAND 700 with eight colours and perfecting - for variable commercial printing

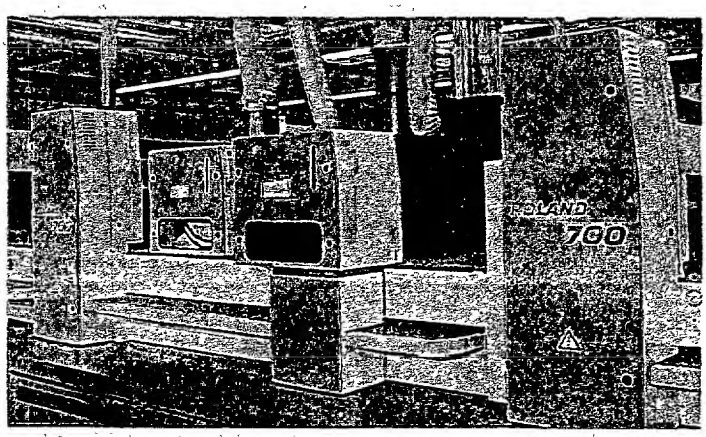
The standard in packaging printing.

Flexibility for profitability.
The ROLAND 700 is ideally suited for the characteristic jobs in packaging printing. With its high flexibility, it can produce long runs of collapsible boxes as perfectly as display packaging in low numbers. The short makeready times and the resulting fast changes of jobs are a requirement for that. In addition the numerous automations always allow you a reliable production. All these are advantages of the continuous printing process which can have a special effect on the production output in packaging printing.

Enhancement as desired.
Due to the high-quality inline coating system - consisting of the chambered doctor blade and the screen application roller, your ROLAND 700 can provide still more possibilities. As desired, the press can be equipped with single or double coating modules. The similar concept of the coating module and the printing unit permits the coating module to pass the sheet in a printed condition as well. The precision of the sheet travel is also guaranteed here. The Roland Seccomatic dryer integrated in the new Air-Glide delivery will always yield reliable production results

Added value by perfecting.
The attractive front side in four- or multi colour printing, the rear side in one or several colours with barcodes, product descriptions and instructions: the ROLAND 700 can cope with that in one pass of the machine by a single-drum reversal. Efficient in printing, profitable for you.

Packaging printing according to industrial standards - the ROLAND 700 can offer a highly specialized technology for all types of production.



The ROLAND 700 double coating module satisfies all enhancement desires.

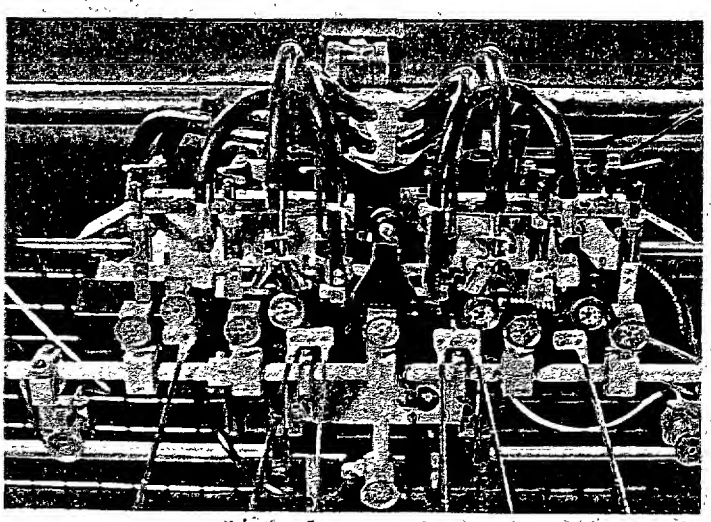
With exemplary character in the sheet travel.

The proven ROLAND 700 sheet guide can ensure proper production conditions in the medium format.

Quality with guarantee.
The optimum printing quality of the ROLAND 700 starts at the feeder where a suction tape feed board and the pneumatic side guides guarantee a mark-free sheet travel. An automatic lateral pile correction and a highly effective sheet deceleration support an exact alignment and feeding of the sheet. From printing unit to printing unit, the sheet transport is performed by transferters - a pioneer technology which was applied in the first ROLAND 700. This allows even distortion-free stock to be guided without contacts, avoiding scratches or smears of fresh ink effectively. Ventilator paths additionally increase the stability of the sheet. Finally, the new extended AirGlide delivery can optimize the sheet travel path, and ensure that the material is piled well.

Change of formats in record time.
During a change of jobs, all required format settings are performed automatically and parallel to the other set-up processes. The ROLAND 700 can centralize up to 14 individual settings: among other things, on the suction head, on the sheet stops in the feeder and delivery, on the suction roller axle in the delivery, blanket-to-impression cylinder, and the setting of the powder device. Thus, all functions can be prepared for the new printing process within the shortest time.

Production printing stability by control.
The ROLAND 700 uses extensive control systems to prevent a varying quality and expensive interruptions of the printing process. Double sheets are detected by electromechanical and photoelectrical means, and are automatically stopped on the system. While the machine is running, the sheet arrival time can be controlled exactly, and a misaligned sheet correction can be performed. Trend displays on the feeder and the central control console can even show the slightest deviation in the sheet travel, for the printman to eliminate the causes of stops before the machine stops. In addition, the misfed sheet detector in the sheet guide path can safeguard the production and avoid damage to the machine.



The suction head on the feeder: an exact sheet alignment starts here.

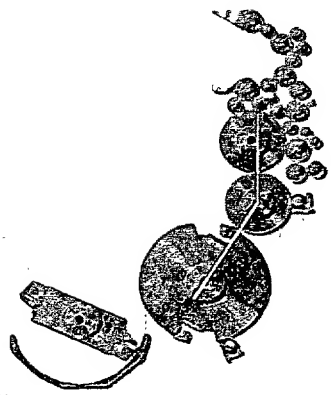
With technology to success.

The printing unit for perfection.
Double-size impression cylinders and transferters provide a smooth sheet travel to save the stock. Other advantages are the transfer of printed sheets by the 7-clock cylinder position and plane bearings for the plate and blanket cylinders which alternatively allow a printing process with or without bearer ring contacts. Finally, the drive system combination of a longitudinal shaft and a gear train entirely excludes quality losses by mis-registers.

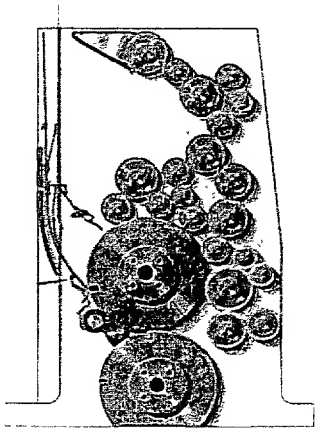
Convenience during a change of plates.
The Power Plate Loading (PPL) system is a fast and safe plate change system for the ROLAND 700: less than one minute for each printing unit is required for a complete change of plates. After an insertion, the new plate is automatically drawn into the front clamping bar. An additional position check in the front rail can guarantee an exact start register to reduce the start-up waste. This can be performed more easily with the APL (Automatic Plate Loading), which is especially important for small circulations or long machine configurations: All plates can be changed fully automatically. Both during the PPL and APL, fine corrections to the circumferencial, lateral and diagonal registers can be performed directly from the central control console. The diagonal register can be set via a declined position ("cocking") of the transferters without influencing the printing zone. Furthermore, the frequently practised levelling of the printing plates is eliminated so that they can be re-used.

The washing system has a saving effect.
Using the fully automatic washing facilities of the ROLAND 700, you can clean the blankets and impression cylinders in only a few minutes. On the central control console, the operator can select all individual washing processes and start them simultaneously. The different programmes which can be set depending on the degree of contamination will always provide an optimum cleaning result. And the brush washing systems only consume a minimum of wash, and significantly less wash is evaporated thanks to the largely self-contained design: an important contribution to environmental protection and ergonomy.

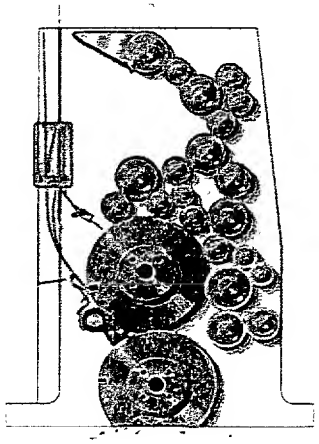
Using the automated ROLAND 700, you can obtain productivity on the highest level by shortest make-ready times and simple operation.



Printing quality in perfection with the 7-clock cylinder position



Automated change of pages (PPL)



Fully automatic change of plates (APL).

More flexible by reversal.

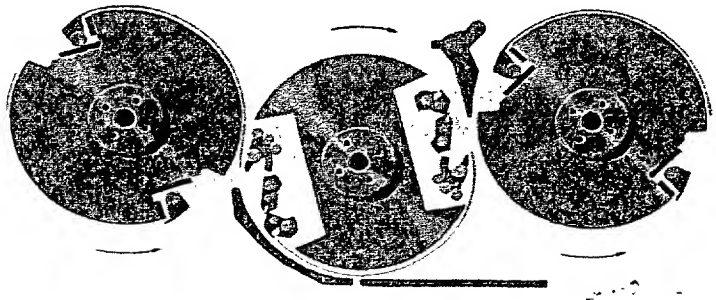
The ROLAND 700 perfecting machine can guarantee an efficient printing process on both sides.

Changeover on command.
As a perfecting machine, the ROLAND 700 can offer the same high automation and operator convenience as the straight printing press does. A press of a key on the central control console is enough - and the conversion of the type of production is performed fully automatically within a short time. The unique automatic impression cylinder washing device, which is particularly advantageous in face and back printing, can be operated just as conveniently. In this operation mode, a regular cleaning is strictly required.

Reversal with distinction.
Using the innovative technology of the single-drum reversal, the ROLAND 700 can provide the most demanding printing quality on both sides of the sheet. This is ensured by the special structure of the perfecting unit made of one single reversing cylinder with a double-size diameter. On the one hand, this ensures a smooth and smear-free sheet travel with a minimum of deformation and, on the other hand, the high register accuracy is maintained.

Without contacts to colour.
The interaction of suction and blast air guides the sheet reliably and without any contact with fresh print ink via the reversing drum. The proper ventilator path setting can even be stored for repeat jobs. At the beginning of the perfecting process, the rear sheet edge is sucked by sucking units in the perfecting cylinder and passed to the perfecting grippers tightly. The special surface of all impression cylinders contribute to very good printing results after a reversal. It does not leave marks on the sheets and is resistant to wear. Additional security is provided by the mis-fed sheet detector both in the reversing drum area and between the downstream printing units.

Job completed.
The ROLAND 700 can be perfectly matched to each job structure: Up to two perfecting modules (depending on the number of colours) can individually be placed at meaningful positions. Thus, the 2/4 configuration is ideal for more than 60 % of the jobs with a 4-colour front page and 2-colour rear page. The stock options from 0.1 to 0.5 and 0.2 to 0.6 mm are absolutely new in face and back printing: crucial for packaging printing specialists, e.g. for the production of blister packagings.



The single-drum reversal: the smear-free sheet travel ensures high printing quality on both sides.

Ink and water at an equilibrium.

Standards for quality.
With its responsiveness and stable ink feed, the ink unit of the ROLAND 700 always ensures proper printing results. The capability of centrally setting the axial clearance of all four ink forme rollers of up to 18 millimetres, and of the ink distributor application points as well as the two changing damping distributor rollers, consistently counteract ghosting effects and an undesired gradual fading. Independent tests performed by FOGRA convincingly confirmed the effectiveness of the special ink unit optimization for avoiding a gradual fading: the results of the ROLAND 700 are up to 85 % above the recommendation of the institute.

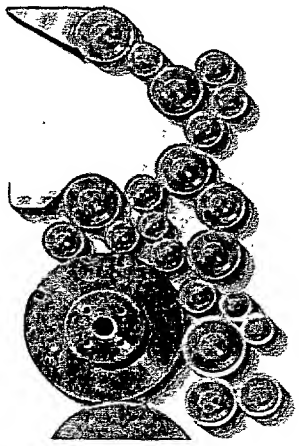
Our programme against waste.
The ROLAND 700 can guarantee stable conditions in the ink unit at any time: unnecessary start-up waste is prevented by the ink feed programme, which saturates the forme automatically with the job-related ink amount, prior to the start. The ink duct roller reverse movement guarantees a constantly high printing quality by a continuous removal of dirt from the ink slide area as well as by a speed compensation. The ink temperature control is similarly effective - which is extremely important for waterless offset printing or for extended printing times of high circulations in traditional sheet-fed offset printing. Even in the case of an interruption of the printing process, the high production run quality is maintained reliably: the ink unit separation prevents the first start-up sheet from being overinked. Another effective facility is the quick start accelerating the machine at a new start - after interruptions of the printing process caused by production - to the previous colour print speed. Even the first sheet is printed again under production conditions, and the number of waste sheets caused by ink variations is reduced - under optimum conditions - from generally 30 to fewer than five.

The Roland Deltamatic damping unit.
A speed difference between the plate cylinder and the damping roller generates a slight slip, the "Delta effect": the result is that hickies can be removed without interference with the printing image, or cannot enter the plate surface. The activation of the Delta effect is performed directly from the central control console without interrupting the printing processes.

Damping solution metered perfectly.
The speed-compensated continuous-feed damping unit provides a continuous ink/damping solution equilibrium. The amount of damping solution can be controlled on the central control console where the transition roller can be switched to integrated or separate damping as required. The ceramic coating of the damping duct roller is a new ROLAND 700 feature, providing a more uniform distribution of the damping solution. This coating is a strict requirement for an alcohol-reduced printing process.

Ink units automatically clean.
The automatic inker washing device provides excellent cleaning results in a time-saving and environment-beneficial manner. A selection of ten washing programmes, which can be started quickly and conveniently from the central control console, is available.

An optimum ink application even for difficult subjects is a feature of the ROLAND 700 ink unit.



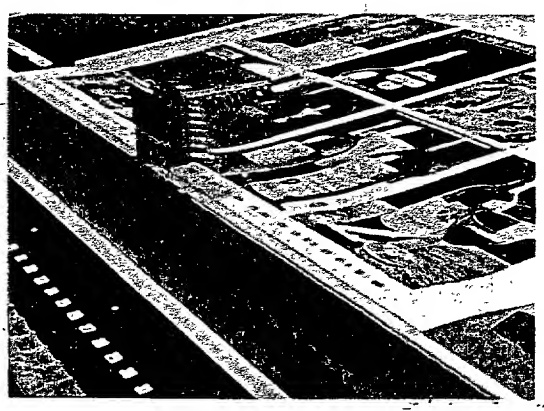
The ink and damping unit with their "Delta effect"

Ink security has programme.

The ink control integrated in the central control console can optimize the ink feed in the subtlest shades.

RCI finds the right tone.
The Remote Controlled Inking (RCI) system integrated in the central control console can considerably reduce the set-up of the ROLAND 700. All required ink key pre-settings are available quickly and exactly, directly from the pre-press stages via the PrepressLink or from the electronic plate scanner EPS or the JobCard. For repeat jobs, the printman can load the values immediately from the internal job memory. The subsequent setting of the ink slides can be performed simultaneously for all printing units by a digital signal transfer and optical fibre cables. Thanks to these exact presettings, later corrections of the ink feed will seldom be required.

CCI automatically applies well.
The Computer Controlled Inking (CCI) system, the comprehensive ink control technology, is also integrated into the central control console. CCI uses a densitometer to register the ink density during the set-up process and the production run, and can detect deviations even the printman will not notice. The system can measure the complete print control bar in almost no time and can correct, if necessary, the ink slide position of all ink units within a few seconds. Thus, you will obtain a constantly high printing quality over the entire print run, profit from the reduced makeready times and save waste considerably. All measuring results can be logged and are available to the customer as evidence of quality. The CCI is supplemented advantageously by the modern PRINT CONSUL system, offering an additional quality evaluation by a detailed process control, or process diagnostic, in clear text and with extensive recommendations for actions.



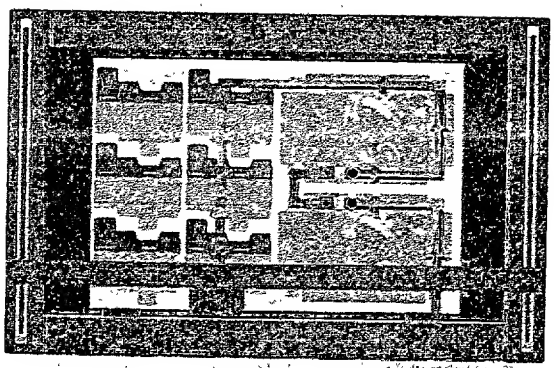
ROLAND CCI. Ink is exactly controlled from the central control console.

Multi CCI is binding for all.
Roland Multi CCI is an especially effective alternative to CCI if you operate several presses. It can be used to connect all presses to a common ink measuring and control system.

Multi CCI 2D can reduce the material costs.
In particular in packaging and special printing where expensive stock is used in most cases, the Multi CCI 2D ink measuring system can show its benefits: It can perform measurements at any point of the sheet without any contacts. Thus, short control sequences can be placed between the blanks or on the gluing strips. Monochrome plate tints or screen tints can even be measured directly in the subject. Continuous control bars on the sheet front edge are no longer required for the assurance of quality, you can save material costs of considerable amounts

LCS performs precise work.
Some jobs are extremely difficult. For example, if the forme for a special ink - often the company ink - just consists of very few filigree lines. Because of a correspondingly low ink transfer, the printing quality of such products has caused big problems in most cases. MAN Roland has solved this problem by its Low Coverage Stabilization (LCS) system. An automatic system only opens every second ink slide by a defined size for controlling the ink feed. The closed ink slides remove the excess ink from the roller system and thus increase the circulation between the ink unit and the ink duct. This means no excess emulging on the rollers, no premature overinking of the ink unit and therefore less waste.

LCS (Low Coverage Stabilization) can guarantee a high printing quality even for difficult subjects.



The Multi CCI 2D non-contact measuring system can measure short sections of the printing control strip, solid or raster areas everywhere in the subject. This saves the printing control strip running back into the press and prevents sheets from being printed.

The new variety of inline enhancement.

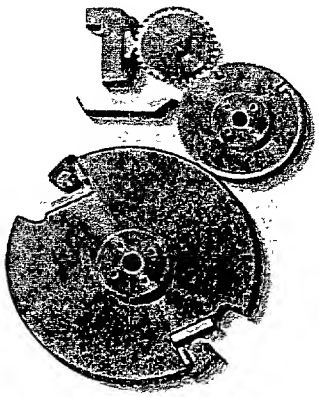
You can use a MAN Roland coating module to extend your product range to increasingly required and enhanced printing products, in a particularly efficient manner.

Coating modules provide opportunities.
The ROLAND 700 can offer you the equipment for the most varied inline enhancements, matched to your individual job structure. Several process steps thus require only one pass, resulting in a higher reliability of production, in addition to a high reduction of time and costs. Like the print units, the coating module can be controlled centrally from the central control console by setting the lateral, circumferencial and diagonal registers, as well as by an adjustment of the printing pressure. Quickly, conveniently and absolutely reliably.

Various applications.
From gold and silver coatings via UV and dispersion coatings up to special varnishes - the ROLAND 700 allows free selections. And the equipment with the double coating module can satisfy even the most stringent customer requirements for more gloss and higher resistance to abrasion. Examples are the application of blister coatings for packagings and the application of "ink, primer, UV varnish". To this effect, the double coating module can be equipped with two transfer modules and the appropriate intermediate dryers.

Varnish metering means precision.
The innovative chambered doctor blade technology with its laser-engraved screen roller is unrivalled in a varnish application to be metered exactly and uniformly. This technology allows the application of a defined coating thickness at a high precision over the whole width. In addition, the process is very efficient: an exact metering will considerably reduce the consumption of varnish. In the future, the traditional two-roller coating module will be available on request.

Roland Seccomatic dryers for perfection.
High-quality prints with inline enhancement or an intensive varnish application impose highest demands for drying. A powerful system such as the Roland Seccomatic dryer can significantly increase the reliability of production. Depending on the type of enhancement and the varnishes used, individual variants are available to the ROLAND 700: IR dryers, IR/thermal air dryers as well as UV intermediate and end-of-press dryers.

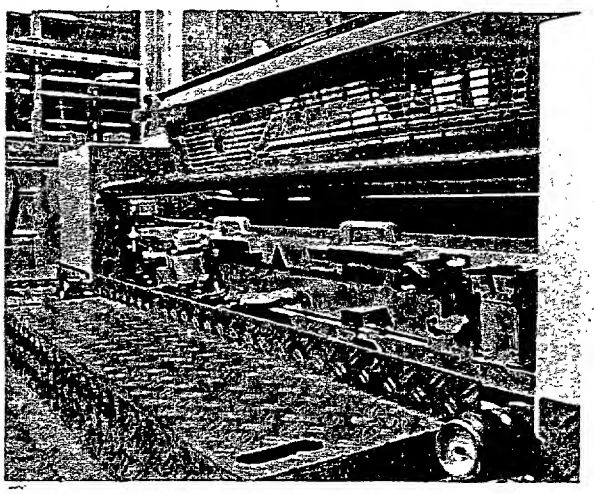


The chambered doctor blade technology also allows fine varnish metering without problems

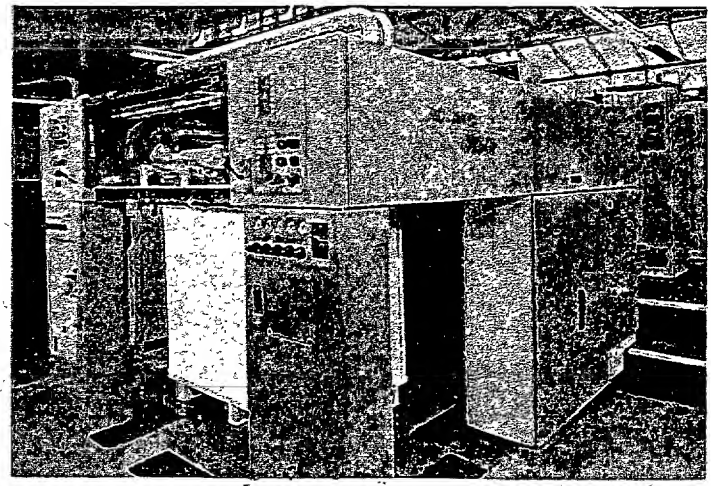
The new varnish changing system.
The new varnish system for the ROLAND 700 is an absolute innovation and extremely quick, requiring only the investment in one or more chambered doctor blades, varnish troughs and hose systems for its function. Thus, the entire conversion process can be reduced from more than one hour to approximately 15 minutes. It is important to reduce the cleaning time considerably if a change is made from UV to dispersion coating. Other advantages are the operator convenience, the low loss of varnish and the extremely low amount of rinsing water.

The new AirGlide delivery for coating modules.
Just as the new standard version for the ROLAND 700 without coatings, the extended AirGlide delivery for coating applications can provide more quality, productivity and ergonomy for the printman. The smoother sheet path conveys the sheet on an air cushion safely to the delivery. Compared to the current model, the actual extension is downstream of the sheet ascent ramp, extending the settling distance by 220 cm - which additionally saves the freshly applied varnish. Other innovative technical details integrated in the AirGlide delivery are added. This includes, for example, a visual check of the sheet travel - for a correction in time - via numerous openings in the side wall, and the automated and therefore extremely reliable removal of control sheets, together with the shade-free and aerodynamically optimized delivery gripper systems. In total this is a multitude of advantages for a more efficient production with the ROLAND 700.

The new varnish changing system - faster conversion and cleaning.



The new "quick varnish change system" conversion within 15 minutes



The new AirGlide delivery: saves the freshly applied varnish.

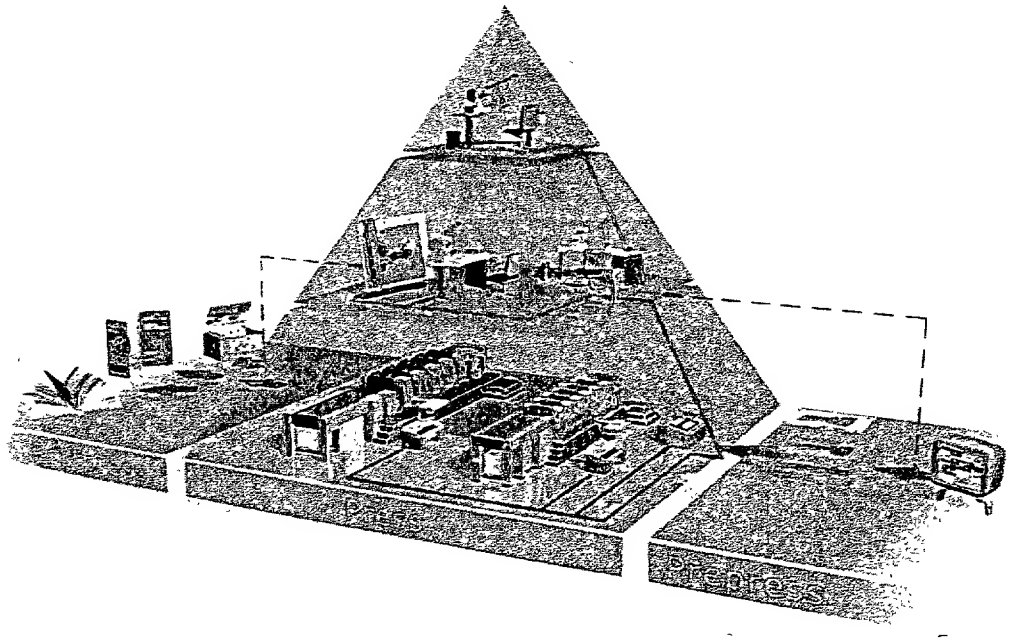
PECOM - a generation ahead.

PECOM can implement a digital production system with interfaces to the pre-press stages and the print-house management.

The core: PECOM-ServerNet™.
The PECOM ServerNet™ is the core of the new modular MAN Roland product generation consistently designed in Windows NT. As a central job server, it allows all connected components to access the job data. The PECOM ServerNet™ can act as an interface to the machine network to allow an exchange of data between the networked central control consoles. For example, an online access to the complete job data of another press is possible for repeat jobs. Prepared jobs can be accepted by another press within a short time. The new network architecture is compatible with the existing PECOM networks.

Platform for interfaces and applications.
The great benefit of the new server architecture is the flexibility and expandability. Other applications and interfaces executing on one computer or distributed to several computers can be arranged in a modular fashion like a "string of pearls". Using Ethernet, they can connect to other production sections and the administrative area of the print-house.

JobPilot for pre-adjustments.
A central pre-adjustment of the presses is of major importance for an efficient industrial production. The new network platform expands the current possibilities: On the one hand, JobPilot includes the technical job preparation with the appropriate presetting of the press parameters, while on the other hand, PressMonitor can use the status control function to display the current manufacturing state of the jobs, and ensure the use of historical production data.

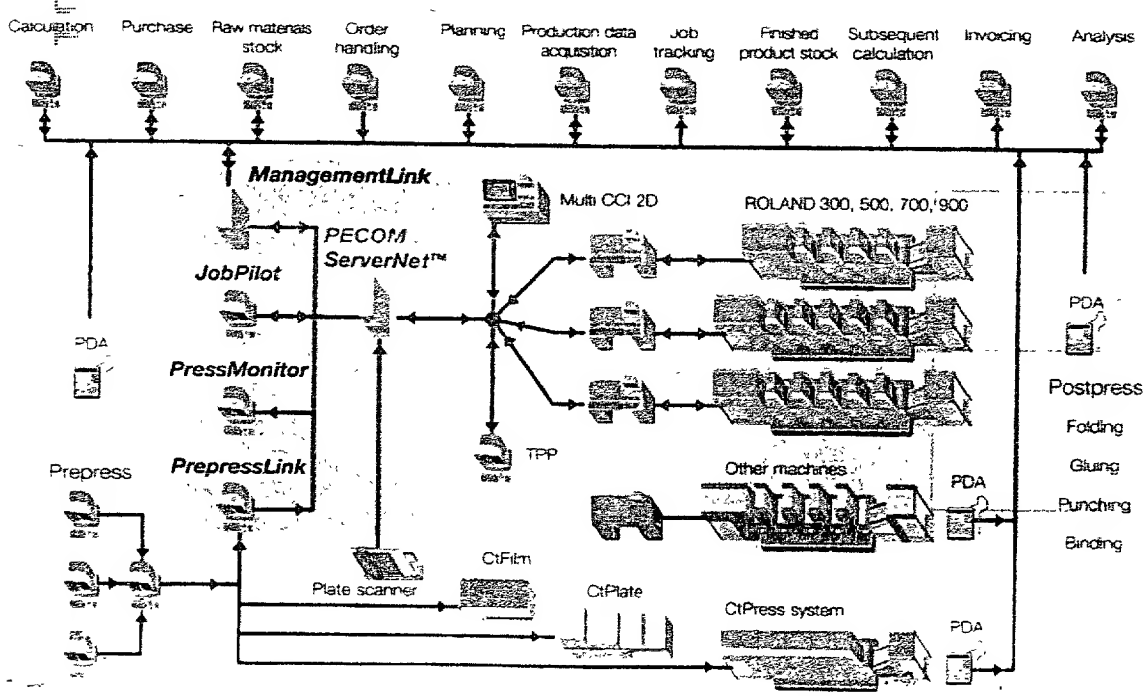


PECOM is the open electronics system of the future allowing the flow of data through many production stages and levels. It can make costs transparent, eliminate double work and optimise the throughput speed. These are important prerequisites for print-houses producing in accordance with industrial standards.

Central presetting, short makeready time.
The JobPilot allows the presses to be preset from the office PC. This process is much more cost-efficient than presetting on the production machine, with its significantly higher hourly rates. Furthermore, the production know-how archived from previous jobs can be copied and made available to all machines. The use of repeat and standard jobs results in a more efficient job preparation; time-consuming multiple or wrong entries as well as misunderstandings and queries are avoided. The printroom control function can contribute to an optimization of the job sequence, and to saving time in the press preparation.

In a leading position at the central control console.
The printman has control of everything at the PECOM central control console. Using an ergonomic touch-sensitive keyboard, the printman can control the entire press system with its additional modules: printing units, deliveries, register settings, ink control, coating modules, dryers and other components. The operator can initiate changes of plates and formats as well as washing processes or ch anges of stock. Newly collected or stored production data and presettings are passed to the components of the printing system from the central control console. Conversions are at a touch of a finger, quickly and conveniently. The parameters of the current production can be called on the screen at any time, and are represented in a clear fashion. Menu prompts, working instructions and on-line help texts in the national language support the operation for simple operator control. The profitable effects: automated processes, high throughput speed, perfect quality, reliability of operation and optimum documentation of the jobs.

PECOM can interconnect multiple printing systems and the process steps from job scheduling to the evaluation of operating data.



The PECOM-ServerNet™ network platform provides the basis for an individual open system which can network all technical and commercial processes in a centralised way. Project planning through MAN Roland can provide investment security and guarantee compatibility with future extensions of the printing system.

Ergonomy unlike anything previous.

User-friendly operation, soundness and highest capacity: This is the ROLAND 700 design.

Simple operator control.
Each detail emphasizes the sophisticated ergonomy of the ROLAND 700. A minor example is the location of the operator controls for right-handed and left-handed persons. The operation of this press is known to be simple and safe for each printman.

Easy to maintain.
Regular maintenance increases the lifetime of your press. Complex maintenance work is really not necessary. Therefore, the ROLAND 700 can make it especially easy for you. For example, the automatic computer-based lubrication system takes care of important lubricating points for a high safety of operation. Daily lubricating intervals are eliminated, and the personnel are relieved of this work.

Solid design, safe drive.
The traditional side frame design is characteristic of the well-built ROLAND 700, giving a superior stiffness to the printing units and ensuring an extremely low-vibration press run. Using a gear train and a longitudinal shaft, the drive prevents mis-registers or doublings during a change in the press speed, or during a change in the oscillation timing or during acceleration.

High compatibility with the environment.
Protect the environment, reduce the costs. The various automation and rationalization facilities of the ROLAND 700 can also contribute to the protection of the environment efficiently. Each printed sheet you save, each litre of cleaners, ink or varnish consumed less will save precious raw materials and avoid environmental pollution.

The ROLAND700 is easily accessible for each printman

Competent service world-wide.

Good advice on all questions.
MAN Roland and its distribution partners are present in every region of the world. Highly qualified staff members can provide advice regarding the technology, quality and efficiency of our printing machines if you are planning a new investment or wish to optimize your production.

The Offenbach Graphic Center.
A live demonstration of the press is always most instructive. In our Offenbach Graphic Center approximately 45 printing units are ready for a demonstration on about 3,000 square meters. Even your special stock and your formes can be used for a demonstration.

MAN Roland sets precedents.
In the Offenbach Training Center MAN Roland can provide training for printmen, electronicians and mechanicians. CBT, the computer based training via CD ROM, has proved an attractive and efficient method. The interactive three-level training programmes not only convey knowledge, but also include exercises and an extensive technical dictionary.

Fast spare part supply.
A diagnostic system integrated in the machine is responsible for the safety of production for a perfect run. Should a malfunction occur, contact your local MAN Roland partner, if required. Original spare parts needed can be requested by an electronic access to the stock of the world-wide distribution and service partners: even special parts will be available on the following day in more than 90 % of all cases

Using a well-developed distribution and service network, we are in your proximity and available to you for all issues concerning sheet-fed offset printing.

You can rely on the world-wide MAN Roland service

For more profitability by design.

ROLAND 700				
Equipment		Basic version	Coating module, delivery with extension	Reversible perfecting presses
Printing units		2 - 8	2 - 8	2 - 10
Sheet format (mm) min. max.		 340 x 480 740 x 1,040	 340 x 480 740 x 1,040	 340 x 480 720 x 1,040
Stock thickness (mm)	Standard	0.04 - 1.0	0.04 - 1.0	0.06 - 0.6* 0.06 - 0.4**
	Option			0.1 - 0.5** 0.2 - 0.6**
Print area max. (mm)		715 x 1,020	715 x 1,020	700 x 1,020**
Feeder pile height (mm) Delivery pile height (mm)		1,180 1,080	1,180 1,080	1,180 1,080
Sheet output per hour face printing perfecting printing		15,000 –	15,000 –	15,000 12,000

*For face printing.
**For perfecting printing.

ROLAND 700:
Printing units, dimensions and details.

Equipment	ROLAND 700 Basic version	Coating module, delivery with extension	Reversible face and perfecting presses
Printing units	2 - 8	2 - 8	2 - 10
Sheet format (mm)			
min.	340 x 480	340 x 480	340 x 480
max.	740 x 1,040	740 x 1,040	720 x 1,040
Print area max. (mm)	715 x 1,020	715 x 1,020	700 x 1,020**
Stock thickness (mm) Standard	0.04 - 1.0	0.04 - 1.0	0.06 - 0.6*
			0.06 - 0.4**
Option			0.1 - 0.5**
			0.2 - 0.6**
Feeder pile height (mm)	1,180	1,180	1,180
Delivery pile height (mm)	1,080	1,080	1,080
Length/width/height (mm)			
2 printing units	8,136 x 3,450 x 2,140	11,145 x 3,450 x 2,140	8,136 x 3,450 x 2,140
3 printing units	9,316 x 3,450 x 2,140	12,325 x 3,450 x 2,140	9,316 x 3,450 x 2,140
4 printing units	10,496 x 3,450 x 2,140	13,505 x 3,450 x 2,140	10,496 x 3,450 x 2,140
5 printing units	11,676 x 3,450 x 2,140	14,685 x 3,450 x 2,140	11,676 x 3,450 x 2,140
6 printing units	12,856 x 3,450 x 2,140	15,866 x 3,450 x 2,140	12,856 x 3,450 x 2,140
7 printing units	14,036 x 3,450 x 2,140	17,045 x 3,450 x 2,140	14,036 x 3,450 x 2,140
8 printing units	15,216 x 3,450 x 2,140	18,225 x 3,450 x 2,140	15,216 x 3,450 x 2,140
10 printing units	–	–	17,576 x 3,450 x 2,140

Sheet output per hour			
Face printing	15,000	15,000	15,000
Perfecting printing	-	-	12,000

*For face printing.
**For perfecting printing.

MAN ROLAND

Profitability by Design.

ROLAND700: Standards and options.

Printing units	2	3	4	5	6	7	8	10
Suction tape feed board with sheet deceleration	X	X	X	X	X	X	X	X
Automatic format adjustment	X	X	X	X	X	X	X	X
Automatic stock thickness setting	X	X	X	X	X	X	X	X
Register control for circumferencial, lateral and diagonal registers	X	X	X	X	X	X	X	X
RCI ink control	X	X	X	X	X	X	X	X
Automatic ink unit separation	X	X	X	X	X	X	X	X
Remote adjustment of the ink distribution unit	X	X	X	X	X	X	X	X
Ink duct roller reversal	X	X	X	X	X	X	X	X
Adjustment of the axial clearance for the inking rollers	X	X	X	X	X	X	X	X
Speed compensation for ink and damping units	X	X	X	X	X	X	X	X
Roland Deltamatic damping units	X	X	X	X	X	X	X	X
Ceramic-coated damping duct roller	X	X	X	X	X	X	X	X
Automatic inking roller wash-up device	X	X	X	X	X	X	X	X
Automatic blanket washer	X	X	X	X	X	X	X	X
Automated PPL change of plates	X	X	X	X	X	X	X	X
Rear plate clamping bar, divided into 7 segments	X	X	X	X	X	X	X	X
Manual non-stop device, for feeders	X	X	X	X	X	X	X	X
Visually controllable sheet travel in the AirGlide delivery	X	X	X	X	X	X	X	X

Printing with and without bearer ring contact	X	X	X	X	X	X	X	X
Diagnostic system	X	X	X	X	X	X	X	X
Data communication via optical fibre cables	X	X	X	X	X	X	X	X
Automatic non-stop feeder (including logistic system)	O	O	O	O	O	O	O	O
Quick start	O	O	O	O	O	O	O	O
Fully automatic APL change of plates	O	O	O	O	O	O	O	O
CCI, Multi CCI, Multi CCI-2D ink control system	O	O	O	O	O	O	O	O
Ink unit temperature control	O	O	O	O	O	O	O	O
LCS (Low Coverage Stabilisation)	O	O	O	O	O	O	O	O
One to two sheet reversal devices	O	O	O	O	O	O	O	O
Automatic impression cylinder wash-up device	O	O	O	O	O	O	O	O
Coating module including screen roller and chambered doctor blade	O	O	O	O	O	O	O	-
Double coating module with one or two transferter modules	O	O	O	O	O	O	O	-
Quick-action varnish change system	O	O	O	O	O	O	O	-
Base substructure (height 275 mm or 550 mm)	O	O	O	O	O	O	O	O
PECOM networking	O	O	O	O	O	O	O	O

X = Standard, O = Option.
The table contains a selection of important equipment details.
Further information and special configurations on request.

The ROLAND 700 is subject to continuous enhancement and altered according to the results of research and development gained through practical experience. Therefore, we reserve the right to modify design features and technical data. Only the confirmation of order will be binding.

MAN Roland
Druckmaschinen AG
Postfach 10 12 64
D-63012 Offenbach am Main
Phone +49 69-8305-0
Fax +49 69-8305-1023

www.man-roland.com

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GRAPHIC ARTS MONTHLY

Technology Tools

In-Line Coating Spurs Sheetfed

Flexo, metallics, fluorescents, and double-hits create a new generation of on-press special effects.

There's no respite in customer demand for gloss or matte coatings on multicolor sheetfed printing jobs. Now comes the next generation, a forceful drive by press manufacturers and OEMs to supply printers with new in-line coating technology that's integrated to the specific press line.

It's not enough to just coat a job for protection and high-gloss sheen. Such techniques as flexotype spot coating in intricate patterns, intermediate ink sealing to allow for immediate coating in-line, and use of water-based metallic dispersion inks and fluorescents are some of the innovations being explored.

At the Drupa '95 exposition in Germany last month, Heidelberg displayed its MCT Multiple Coating Technology, MAN Roland demonstrated its Roland 700 double-coating module, and Printing Research Inc. introduced its Super Blue EZ interstation flexo printer/coater.

In addition, Mitsubishi Lithographic Presses, which has been offering double coating for the past six years, developed a new in-line, anilox-engraved application roller for metallic inks as well.

Packaging printers have led the way, installing coating units as a standard part of the press. But commercial printers, seeking to entice high-end jobs from designers and ad agencies and enhance their value-added services, are now adding these in-line coating units as well.

Shortened lead times

"We're making the move into this new in-line, double-coating technology primarily because of our shortened lead times," comments Dave Rydell, printing manager for Diamond Packaging, Rochester, N.Y., which installed a new MAN Roland 700 with double coater in May.

He adds, "This press will allow us to almost simultaneously move a job from delivery to feeder and UV coat it all in line. We don't have the time to use off-line coating units and wait for the drying process."

While many consider the coaters to be aimed at a specialty market, their popularity cannot be contained to one certain niche. "Lots of printers are showing interest in the technology. I had a printer who wanted to install three of our in-line, anilox-engraved application rollers immediately," remarks Randy Siver, Mitsubishi's sheetfed product manager.

Printing Research installed a prototype of its Super Blue EZ unit at a large commercial printer. After testing the printer/coater on its seven-color 40" sheetfed press, the printer placed an order for a production unit to be up and running this fall on the first printing unit of its even newer six-color press.

The Printing Research device is installed directly on one of the printing units for applying aqueous or UV-based metallic, opaque white, fluorescents, or specialized coatings, such as pearlescents, between units for downstream overprinting in a single pass.

"By using our flexo printer/coater, printers can lay down a metallic ink with a flexo unit at the beginning of the press, then take the job down through the press and enhance the image," explains Warren Bird of Printing Research. "The result can be very realistic or very surrealistic, depending on how and where the metallic effects are applied to the image, giving it a lot of walk-by appeal."

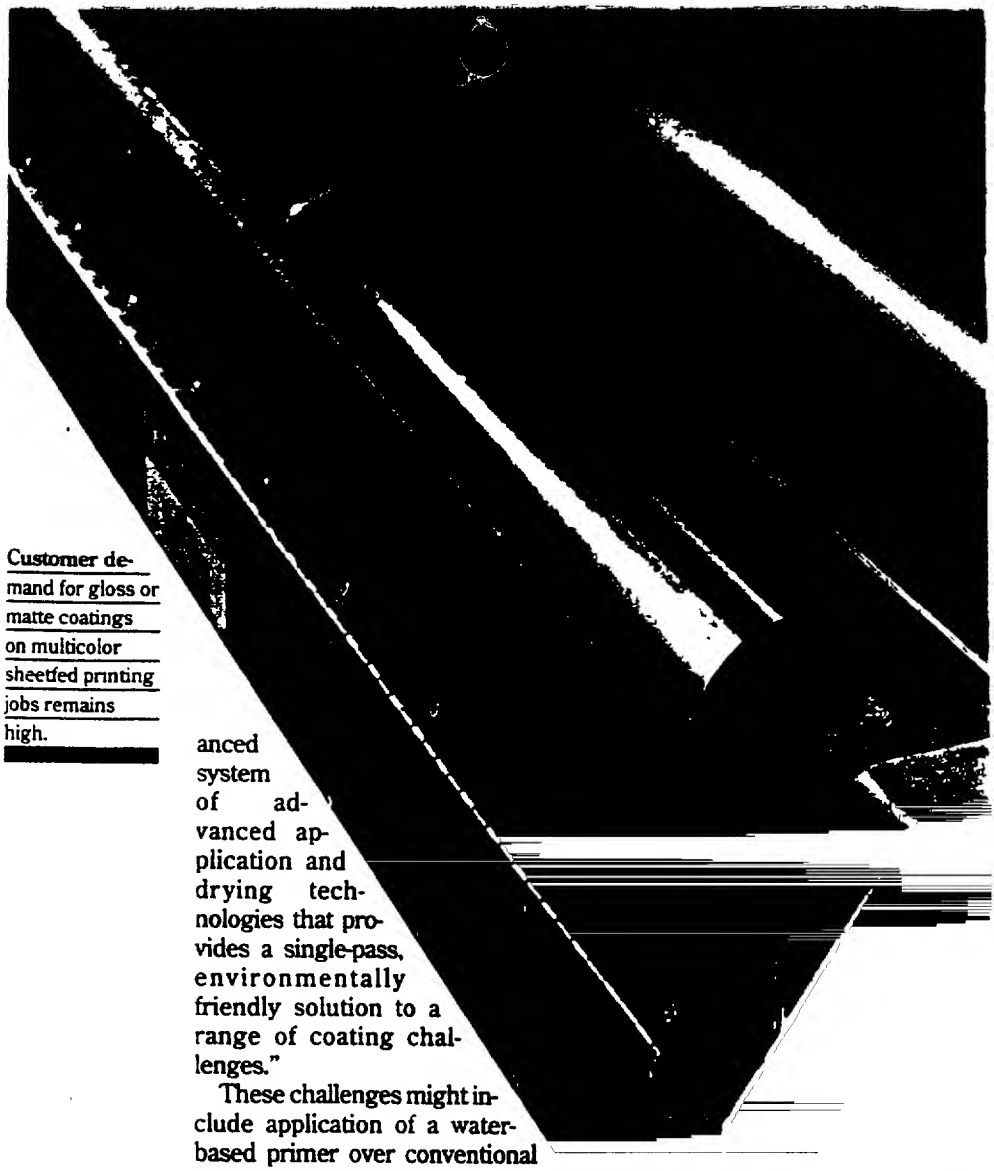
Bird reports that the printer/coater is receiving "tremendous reception" from printers of wine labels, greeting cards, fine-art reproductions, and specialty packaging. In conjunction with the unit, Printing Research is mar-

By Debora Toth
Project Editor

keting both its cold UV and HV hot-air interstation and delivery drying systems. Both alleviate the problem normally associated with upfront in-line coating.

While this printer/coater fits at the front end of a press, Heidelberg's Multiple Coating Technology is installed at the back end. MCT provides package, label, and commercial printers with a way to produce high-gloss coatings, metallic finishes, and related special effects, while staying within the bounds of more stringent environmental regulations.

The system, available on new Speedmaster CD models with six or more printing units, consists of a coating tower, drying unit, second coating tower, and extended delivery. A combination of infrared dryers, hot-air knives, and UV curing systems are strategically placed throughout the press line to accommodate various coating materials.



Customer demand for gloss or matte coatings on multicolor sheetfed printing jobs remains high.

Mark Kozlowski

In-line application

The configuration, which is also designated as L-Y-L, allows in-line application of two coatings in one pass. This provides more lustrous results and allows use of a virtually unlimited combination of UV and aqueous coatings, varnishes, and water-based metallic finishes.

Heidelberg's coating system is controlled by CPTronic, the digital press-operating system. The connection allows the press operator to adjust and activate the system's functions from a single console. Utilized is a unique roller configuration that minimizes the number of splits the coating must undergo before reaching the sheet. The result is a thicker, more uniform application by each of the two coating units.

"Multiple Coating Technology involves more than bolting coating towers onto a press," says John Dowey, Heidelberg USA's director of marketing for Speedmaster presses. "This is a balanced system of advanced application and drying technologies that provides a single-pass, environmentally friendly solution to a range of coating challenges."

These challenges might include application of a water-based primer over conventional inks, providing a stable base for a UV coating laid down in-line by the second coating unit.

Or the coater could provide more efficient production of water-based blister coatings without need for expensive off-line processing.

A third use is to offer a more dramatic use of spot dull and gloss UV coatings, which can be applied in line to provide dimensional effects and enhance rub resistance on a variety of printed products.

End of bronze age

Finally, the new in-line coater is a productive and less costly replacement for bronzing machines, whose use has become restricted by environmental concerns. The in-line sequence involves printing with conventional inks, use of spot metallic dispersion coating, and sealing with a gloss protective aqueous coating.

The first installation of a Heidelberg 40" six-color Speedmaster CD equipped with Multiple Coating Technology was HM Graphics, a sheetfed printer in West Allis, Wis. specializing in intricate pop-up pieces, unusual packages and cartons, and special point-of-purchase displays. The press was installed in September 1994.

Jim Sandstrom, president of HM Graphics, says one of the greatest benefits of the new press is its ability to apply UV coating immediately after printing with standard intense bright inks. Until now, special dull inks had to be used when applying UV coating to a printed project. The new press has two drying units that make the process possible, he says.

This spring, Williamson Printing of Dallas took delivery of a six-color Speedmaster CD with MCT option, which joins a six- and a seven-color Speedmaster CD with in-line coating.

"In-line coating not only adds to

the appearance of our work," says Jesse Williamson, company president, "but its ink-sealing capabilities also allow us to turn jobs around faster. It's another value-added service we can offer our customers. The new Multiple Coating Technology makes it more viable than ever."

At the Drupa show, MAN Roland demonstrated the double-coating option for its model 700 sheetfed press. For the past year, the manufacturer has been presenting seminars across the country to introduce the new process, joined by supplier partners DuPont (plates), Grafix North America (dryers), and Hostmann-Steinberg (Huber inks), who worked with MAN Roland to develop the double-coating system.

The MAN Roland system consists of twin high-tower coaters that let printers apply, in a single pass, high-quality metallic finishes, as well as double coating, such as a water-based primer plus UV blister packaging coats.

Ensures exact measuring

To maximize flexibility, the unit can be installed to operate as a two-roller nip coating system or as a chamber-type ductor blade and anilox roller. The latter option ensures exact metering of the coating, making for greater economy and accuracy in coating thickness, along with more even application and consistency even though the press speed or coating viscosity may fluctuate during the run.

The Grafix drying system speeds setting and drying without heating the substrate. Interstation warm and hot-air knives remove moisture from the sheet as it passes between the coating towers, and cold-air knives prepare it for the second coating.

Finally, an aqueous coating dryer or UV dryer is used on the sheet with cold-air knives to remove heat from the substrate for better control of pile temperatures.

Among the hot on-press trends: metallics, fluorescents, and double-hits.

DuPont entered the double-coating development process by providing a new metal-backed photopolymer flexo plate, the Cyrel CL4 coating plate. These plates are designed to replace the expensive and time-consuming process of cutting press blankets on computerized plotters for spot coating.

Cyrel plates, which are plastic relief plates, are imaged photographically by exposure to a negative, followed by processing. The result is a reproduction of the film that can be mounted quickly into register. DuPont has offered to develop a "fingerprint" for each press to determine its exact imaging characteristics and variations.

By working with Hostmann-Steinberg, MAN Roland 700 users with double-coating technology can utilize the firm's new Acrylac acrylic-based metallic inks, which are formulations of gold and silver inks that use large pigment particles for added brilliance and easier application.

Acrylac inks applied in the coater may be able to replace some off-line foiling procedures with in-line metallic ink application.

The first two installations of MAN Roland 700 presses with double-coater system are Diamond Packaging, Rochester, N.Y., and Royal Paperbox, Los Angeles. Both were scheduled for late May.

"We're hoping that this new press with double coater will open the door into cosmetic and other high-end folding carton work," says Dave Rydell of Diamond Packaging. "We've been exp menting in the past with in-l aqueous coatings on our presses but they never gave us high gloss we needed."

Rydell says the first use for new double coater is to lay dow primer and top coat of aque coating in line. "Since we did have UV coating capabilit before, this coater has an ani roller that we can utilize to o our clients in-line metallic ink c ing for less cost," he says. "O other plan is to do combinati coating jobs, such as laying do a matte finish with waterbas coating, then spot coating with coating."

Replaces bronzing process

In the meantime, Mitsubi Lithographic Presses, worki with a vendor, has developed own in-line, anilox-engraved plication roller, which can be us to replace the bronzing proce The in-line unit is followed b tower coater and an extend delivery for curing opaque inks.

The unit, built specifically one customer, is being field test before being marketed to t industry in general. It should up and running in the fall.

"Typically, when applying m tallics you get no clear definition the trap line," explains Siver Mitsubishi. "But this process pu a heavy ink film on the substra making it a cleaner trap. Printe are looking for a more metall glossier, shinier look."

While printers investiga these new in-line coaters, rum has it that additional manufact ers will be soon introducing ne products. Regardless of wheth they serve the packaging or co mercial markets, printers w choose coating will be able to f ther enhance and differentia themselves from the competitio

Coating technology is beco ing a fundamental component the offset printing process.